Electrical contracting

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CONTRACTOR ~ DEALER

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Time for a Showdown

The time has come when the man who deals in electrical goods at retail should sit down alone and have a talk with himself. He has heard what others have to say about retail merchandising in the electrical industry; he has his own past experience to refer to; he has become acquainted with the workings of other branches of the industry; so now he should hold a heart to heart confab with himself and learn where he stands.

During the past few years the contractor-dealer has had easy picking—in fact there was nothing to do but pick, as his goods sold themselves. He selected his stock from distributors that could quickly supply him. With a thousand and one appliances to choose from, he picked those upon which the supply jobber gave him the best terms, or those whose manufacturers gave him the most free advertising.

It mattered little whether or not the washer, or the toaster, or the cleaner, or the fixture, or the iron, or other appliances and devices which he handled were trade marked; it made little difference to him of the brand or of the future usefulness of the article which he sold to his customer, so long as he supplied the demand which had been created by manufacturers and distributors. He was justified in believing that he was the logical retailer of things electrical. It was pretty easy sailing. He loaded his shelves with merchandise and had a goodly stock in reserve.

Then there came a sudden slump, as there usually does in the heyday of our prosperity. The public tightened up its purse strings and decided that it had reached the saturation point on profligate purchasing. And that is where the electrical retail merchandiser pulled in his sails. He had struck a snag—the first one of any moment that he had encountered in his comparatively short life.

The first thing he thought of at that time was to get rid of his large stock. He figured that he would turn that into money and then he could await a revival of business. He began to unload—and he kept on unloading until his shelves were bare. Reaching that point, he sat down to wait—and he is waiting yet—for business that will never come back to him unless he quickly changes his tactics.

In the first place, the contractor-dealer had no excuse for overbuying; he has had merchandising and financing, and turnover talked to him so long and so earnestly that he should have learned that lesson. In the second place, he should know that he could not sell goods from empty shelves; customers go where stocks are complete, though not necessarily large. Thirdly, every live electrical contractor-dealer realizes that if he is to become the leading retail distributor of such goods, he must be on the job all the time; none of the wise ones will lie down just because some calamity howler tells him that there is to be a great financial disaster.

As a matter of fact there is not and was not a buyers' strike. That part of the public that had contracted a mania for foolish buying ran out of money; others observed the changed conditions and hesitated; a temporary lull in business was the result. A generally unsettled condition coming from the world's unrest brought about a depression that was as natural as the rising of the sun.

This condition does not mark the end of the world, nor does it mean that there never will be a revival of business. But there are some contractor-dealers who exhibit every evidence of believing in such a state. They made no effort to provide themselves for the future; they simply devoted all of their energies to unloading their stocks without replacement.

As self preservation is the first law of nature, electrical manufacturers immediately began to devise ways and means of marketing their wares. They say if they cannot market their products through the electrical contractor-dealer, they must find some other outlet. So there are some of them that are doing business—big business, too—through other sources. One manufacturer reports an increase of twenty percent in volume through his own retail stores; another one shows that other retailers are thirty percent ahead of contractor-dealers in point of sales; still another is switching to department stores—and all because the contractor-dealer will not or does not now replace stock enough to supply the demand.

Then indeed it is high time for the electrical contractor-

dealer to sit down with himself and hold a silent conference. He must consider all of these questions: Is he the most efficient medium for the retailing of electrical goods? Can he finance the operation? Does he know how to buy? Is he a salesman? Is he a good executive? Does he heed advice? Does he seek information concerning his business? Can he ever be a real storekeeper?

These are only a few of the many questions he must answer. He must study himself—analyze himself—learn himself—know himself—and then if he decides that he can and will be the leading retail distributor of things electrical, let him show the supply jobber and the manufacturer, as well as the public, that it pays to buy electrical goods from electrical contractor-dealer stores.

The Business Record

Electrical merchant-contractors who are patiently waiting for their establishments to increase in volume of business before beginning to keep books are making a grave mistake. Such beginnings seldom end successfully, for the man with such ideas, as the active head of any business, is sure to retard its growth.

The National Association of Electrical Contractors and Dealers spent a great deal of time, labor, and expense in devising a simple set of blank forms on which the daily records of a small contractor-dealer business can be kept at a minimum cost and with the least trouble. No bookkeeper is required to jot down the transactions on these forms. Every operation is explained in the simplest terms. Anybody who can read and write will readily understand how to use this set.

In these days of close figuring, the man who does not make a record of his transactions has but little chance to succeed. Profit in the head and profit on the books are two entirely different things. Many times a loss is mistaken for a gain unless the figures are there to prove it. No man will sell goods for less than he paid for them, neither will he pay out for labor and material on a wiring job more than he collects for it—not if he knows it. But nine times in ten he does not know it unless he has it down in black and white.

Realizing these truths the National Association issued its new Business Record. Reports from users indicate that it fills all requirements. It is simple in arrangement, easy to operate, and answers the purpose of a well regulated bookkeeping department, without the expense and detail.

For the larger business which employs a regular clerical force and handles a volume of business that requires an accounting department, the National Association's Standard Accounting System is recommended. It is being used in all sections of the country with entire satisfaction. In California it was adopted by the State University for purposes of demonstration and instruction. That alone is proof of its efficacy.

Both of these sets will be supplied by National Headquarters upon application—either to members or non-members of the National Association. Contractor-dealers who are not now keeping an accurate and standard record of their business transactions should look into this matter at once. Business is now being placed on a more substantial basis than ever before. The successful business man must know where he stands—he must be able to readily figure his standing from his written records.

Full information relating to either the new Business Record or the Standard Accounting System for Contractors and Dealers, will be sent upon application to National Headquarters.

When Business Sleeps

Business is never dead, but sometimes it goes to sleep. At such times all that is required to awaken it is a loud noise, with plenty of energy back of it.

When building activities began to lag it looked to those in the contracting end of the electrical industry as though business was dead, sure enough. Those who had passed through similar periods recognized the symptoms of drowsiness and immediately began preparations to keep it awake.

First there was the campaign of old house wiring which the contractor had been too busy to attend to at an earlier date. A little investigation, some serious study, and a few days of careful figuring was enough to prove to Mr. Contractor that he could keep himself busy, furnish occupation for his help, and keep his establishment running on a profitable basis by inaugurating an intensive campaign along these lines.

Then there was the industrial lighting campaign also awaiting him. He had never had time to give much thought to it before. He looked around him and found plenty of business of this kind right in his immediate neighborhood.

Electrical contractors who realized that business was asleep instead of dead, are still busy—and they will continue to be busy so long as there is a house to wire or a factory to light within the bounds of their territory. They saw where they could create some new business, and they put enough energy back of their efforts to get satisfactory results.

Such a course requires thought as well as action; it calls for salesmanship; it necessitates the outlay of creative effort; it means that methods must be changed to fit new conditions; but the experience gained is well worth the energy expended, aside from the profits.

Contracts for old house wiring will not come through the door without solicitation; neither will the manager of an industrial plant ever know the value of proper illumination without being told about it. Personally soliciting these dormant contracts will awaken them quicker than anything else—although newspaper and direct mail advertising go a long way toward arousing such sleepers. With innumerable profitable jobs right in his own neighborhood, the electrical contractor is himself asleep who is not around stirring up such business.

Find Your Grade

It seems to be easy enough for most of us to keep tab on somebody else. But when it comes to examining ourselves—learning our faults and virtues; realizing our shortcomings; knowing the truth about ourselves—that is another matter, and difficult of accomplishment for many of us.

The trouble seems to be that few of us ever stop to take inventory of ourselves. Some of us may strive for efficiency—may be able to detect slight improvements here and

there. At the end of a certain period we may sometimes note considerable progress, but seldom do we possess an accurate rule for measuring our advancement toward the great goal of perfection.

This lack of a system by which we can readily schedule our personal capabilities or capacities invariably reflects in our business life. We are strong or weak; careless or painstaking; friendly or unfriendly; energetic or lazy; methodical or slipshod; enthusiastic or listless—and some place in our business these characteristics will show and be observed by everybody—excepting ourselves.

We talk a great deal about one hundred percent efficiency, which is nothing less than perfection—a standard that none of us may be expected to attain in this world, notwithstanding the fact that our efforts toward that end may be earnest and strenuous.

However, in business there are methods of measurement whereby advancement is shown as plainly as figures on the dial. To the big business man who is careful, affable, systematic, and enthusiastic, any indications of strength or weakness in his business are at once recognized and scheduled. Let the indicator mark a downward movement and the prudent business man is quick to learn the cause and apply a remedy.

The electrical merchant-contractor should equip himself with the means of knowing how his business stands. He should know the truth about his financial affairs, his sales, his purchases, his overhead, his turnover, his investments, his organization, and the industry in which he operates—which also is his as much as is his own stock of merchandise.

Perhaps the best system yet devised for such a purpose is one that is set forth on another page of this issue, reprinted from Printer's Ink. A thoughtful manufacturing concern in the midwest, realizing that retailers seldom know how to ascertain the true standing of their enterprises, has compiled and issued a percentage card which will enable any business man to read his score of progress in endeavoring to reach the point of efficiency.

The card carries two dozen questions, each of which is rated at from two to six points. These numbers indicate the degree of perfection to be reached through each question, the total aggregating one hundred. The user simply carries out his individual standing for each question and the total establishes his grade. He is then enabled to determine whether he is in the seventy percent grade, the forty percent grade, or nearing the one hundred percent grade.

No figures are available as to the average grade established by those who have filled in their ratings. It is safe to say that only a few have approached very near the one hundred percent grade for which they are striving.

While the schedule in question was originally designed for use of retailers in another line, it will be found easily adaptable to the electrical dealer, and strange to say—in the light of contractors feeling themselves so far removed from retailing—it will exactly fit the electrical contractor by omitting two or three questions and slightly altering two or three others.

It will be well worth while for the progressive electrical business man to make out one of these schedules and find his grade. He should learn wherein he is deficient. It will pay any business man to know the truth relating to his own business. "Learning Your Grade," printed elsewhere in this issue, should be carefully studied.

The Code at a Glance

It is with considerable pride that we present to our readers this month the first installment of an alphabetical tabulation of the requirements of the National Electrical Code. Although it is too long for its entire reproduction in one issue of this magazine, it nevertheless is a very condensed compilation of this notable and worthy document which is so familiar to those who work with electricity.

The series referred to is entitled "The Code at a Glance." It is exactly what its title implies, as will be seen by a perusal of part one, although it should be gathered together in its entirety to enable one to put it to the practical use for which it is intended.

It never has been claimed that the National Electrical Code is one hundred percent perfect; but it cannot be denied that it is fully as good as it can be made by those who are responsible for it under the present conditions of revision. Many committees work on it from time to time in an endeavor to perfect it, and the result is all that could be expected—the information is all there, but some of it is difficult to trace and collate for immediate use.

Hubert S. Wynkoop, himself a member of the Code Committee for many years, realizing the advantages that would accrue from a rearrangement of Code requirements for ready reference, has at last succeeded in working out a form that would seem to be ideal in every respect. However, comments and criticisms are invited from our readers, as it is the desire of the author that this plan be perfected before further publication.

Mr. Wynkoop has had a long experience in his chosen field of endeavor. He joined the electrical department of his native city of New York more than twenty-five years ago, and was placed in charge of the electrical inspection service of the five boroughs of Greater New York more than twelve years ago. That he still retains this important position is evidence of his capability.

It must be borne in mind that the present work does not alter the Code as it stands; nor does it pretend to interpret it. It simply has been taken apart, correlated as to subjects, and put together again in alphabetical arrangement, thus rendering it easier to use for those who are seeking instant information.

While the subject matter is not yet all in type, it is estimated that the correlating of topics will eliminate considerably more than half of the text matter of the original Code. This in itself will prove advantageous to users—not only through the shortening of the entire work, but on account of the convenience of finding all information grouped for ready reference.

Contractor-dealers are particularly interested in the National Electrical Code. It is a part of their working equipment. Surely they may be expected to welcome an innovation that will simplify their work in seeking information. "The Code at a Glance" is designed to do this very thing, which a careful reading of the following pages will prove.

Let us have your candid opinion of "The Code at a Glance." Your adverse criticisms as well as your praise will be welcomed.

How to Learn the Requirements of the National Electrical Code

Well Known Electrical Expert Has Made Alphabetical Tabulation in Convenient Form Which is to be Published in this Magazine

Nobody in the electrical industry has any bone to pick with the National Electrical Code. It came into being twenty-four years ago, when the industry was yet young and has passed through many revisions, the last one appearing during the latter part of last year.

The National Electrical Code is the text book of the contractor-dealer branch of the electrical industry. Like a text book, however, it must be given close study in order to clearly comprehend its true meaning. And without an exact understanding of it nobody should attempt to practice its precepts.

Perhaps no other branch of the industry so fully realizes the necessity of knowing the Code's requirements as does the electrical inspector; and surely none other is better able to define its meaning.

For several years Hubert S. Wynkoop, M. E., chief inspector of Greater New York, has been working to this end. During these years all of the many violations of the Code rules have come over his desk, and their immense volume doubtless has influenced him in his present work—that of tabulating the Code's requirements in a form that makes them usable for quick reference.

Hubert S. Wynkoop, M. E.

This task is now completed and Mr. Wynkoop has consented to allow the ELECTRICAL CONTRACTOR-DEALER magazine to publish the results of his efforts for the benefit of its readers. As the entire work would take up ten or more of these pages, it has been deemed advisable to release only a portion at a time, so the entire series will probably run through three or four issues, the first installment following herewith under the title, "The Code at a Glance."

Hubert S. Wynkoop, M. E., was born in New York City, and received his degree from Stevens Institute, across the Hudson River. His first experience in the electrical industry was with one of the companies that afterward was merged into the present General Electric Company.

In the year 1894 Mr. Wynkoop entered the employ of the City of New York. He soon became an electrical inspector, continuing in that capacity until 1898, when he was placed in charge of the city's inspection service. In 1908 he was made chief of the electrical inspectors of the five boroughs of Greater New York, which position he still holds.

Thus is will be seen that Mr. Wynkoop's practical experience, covering a period of upwards of thirty years devoted to electricity, has amply fitted him to speak authoritatively on the subject. Furthermore, he has at all times during his long career been associated with those who work along kindred lines. He is a fellow of the American Institute of Electrical Engineers; member of the American Society of Mechanical Engineers; member of the Electrical Council of Underwriters' Laboratories, Inc., and is an unusually active member of the electrical committee of the National Fire Protection Association. He is also past president of the National Association of Electrical Inspectors.

In Mr. Wynkoop's rearrangement of the Code every subject is in alphabetical order, so it is as simple as the proverbial ABC. Instead of being compelled to look through five or ten or more pages in the Code, in this new form all relative subjects follow in consecutive sequence after a main classification.

Mr. Wynkoop's prefatory remarks which follow will explain the objects of his present work. He makes no attempt at interpreting the Code, but has simply made a brief rearrangement of it so that its requirements can be more readily known to those who need instant information.

The Code at a Glance

A Tabulation of the Requirements of the National Electrical Code

BY HUBERT S. WYNKOOP, M. E.

In Charge of Electrical Inspection, City of New York

I. PREFATORY

Most of the violations of the National Electrical Code which are not of deliberate intent result from carelessness or forgetfulness on the part of the workman. In relatively few instances is the bad work due to sheer ignorance.

In addition to the Code itself, which will amply repay careful study, there are a number of books available to the ambitious wireman, which he should have studied and retained for future reference. These, however, do not serve him readily in his daily work, either on account of their bulk or because of their unsatisfactory arrangement.

The purpose of the present rearrangement—born out of more than twenty-five years' experience in the electrical inspection field—is to serve as a mentor to estimator, wireman and inspector. It assumes that only approved material, devices and appliances will be used, and in appropriate locations; and it aims to direct and warn the competent rather than to educate the ignorant. It conforms to the 1920 edition of the National Electrical Code, but does not treat of marine work, pole lines or signaling (except radio).

Where not otherwise specified, wire numbers are given in the Brown and Sharp (or American) gage.

II. GENERAL PRECAUTIONS

1. Perform all construction in a workmanlike manner, making it neat and permanently secure.
2. Solder each joint after it has been made up securely—or use a splicing device.
3. Tape each joint or device, using rubber tape as well as friction tape.
4. Solder together stands of a conductor before placing under a binding screw. (Does not apply to flexible cord).
5. Sweat each conductor into a lug if the size exceeds No. 8 and a solderless terminal is not used.
6. No. 14 is the smallest conductor permitted for circuit wiring.
7. No. 18 is the smallest conductor permitted for flexible cord or fixture wiring.
8. Double-braided wire must be used for sizes larger than No. 8.
9. Flexible cord is permitted only for pendants, portables or fixtures.
10. Twin wire is permitted only in metal equipment (raceway, armor or conduit), or where flexible conductors are necessary.
11. Varnished cloth wire is permitted only in dry places and in sizes of No. 6 or larger. (Smaller sizes may be used by special permission).
12. Ground conductor must be insulated and installed in the manner prescribed "for wires of the voltage of the circuit to which the ground conductor is attached."
13. A grounded return railway system may supply lighting and power only to cars, car houses, railway power houses and passenger and freight stations.
14. Scrape non-conducting coating off metal equipment and fittings before coupling together.
15. Special construction or special locations are subject to special requirements. Consult:
    - Batteries
    - Cars (Code No. 40)
    - Car Houses (Code No. 41)
    - Constant Current Systems (Series Arc Lighting)
    - Cranes
    - Decorative Lighting
    - Elevators
    - Extra Hazardous Locations
    - Extra High Potential Systems
    - Garages
    - Generators and Motors
    - Heating Appliances
    - Isolated Plants, under 50 volts
    - Moving Picture Equipment
    - Moving Picture Establishments (Theatres)
    - Moving Picture Exchanges
    - Organs
    - Outline Lighting.
    - Portables
    - Radio
    - Series Arc Lighting
    - Services
    - Signs
    - Theatres

III. ARMORED CABLE WORK

See Wiring Methods.

IV. ARC LAMPS

1. General

a. Spark arrester or inner globe required.
b. Netting, not over 1½ inch mesh, around globe.
c. Stranded conductors, where wire larger than No. 14 supplies moveable lamp.
d. Height, outdoors, 8 feet above sidewalk.
e. Height, indoors, out of reach or guarded.

2. Constant Current

a. Hanger board for each lamp.
b. Weight of lamp not on leads.

3. Constant Potential

a. Cutout for each lamp or group.
b. Incandescent lamp, not as resistance or regulator.

V. AUTO-STARTERS

1. Exposed live parts, isolated or guarded.
2. Dust-proof casing, for coils and switches in dusty or linty places or where exposed to flyings of combustible material.
3. Specifications, Code No. 79.

VI. BATTERIES

1. Voltage, equivalent to voltage of a generator.
2. Cells to be mounted on insulators.
3. Corrodible metal, not for cell connections.
4. Room to be thoroughly ventilated.

VII. BOXES

See Outlets.

VIII. CABINETS

See Outlets.

IX. CARS

See Code No. 40.

X. CAR HOUSES

See Code No. 41.

XI. CHOKE COILS

See Resistances.

XII. CIRCUIT BREAKERS

See Cutouts; see Switches.

XIII. COMPENSATOR COILS

See Resistances.

XIV. CONDENSERS

See Resistances.

XV. CONDUCTORS

1. Insulated

a. Ampere ratings of insulated copper conductors are given in the following table. The ratings for aluminum are 84% of the tabulated values.

B. & S. Gage.	Diameter of Solid Wires in Mils	Area in Circular Mils	Table A Rubber Insulation Amperes	Table B Varnished Cloth Insulation Amperes	Table C Other Insulation Amperes
18	40.3	1,624	3		5
16	50.8	2,583	6		10
14	64.1	4,107	15	18	20
12	80.8	6,530	20	25	25
10	101.9	10,380	25	30	30
8	128.5	16,510	35	40	50
6	162.0	26,250	50	60	70
5	181.9	33,100	55	65	80
4	204.3	41,740	70	85	90
3	229.4	52,630	80	95	100
2	257.6	66,370	90	110	125
1	289.3	83,690	100	120	150
0	325.	105,500	125	150	200
00	364.8	133,100	150	180	225
000	409.6	167,800	175	210	275
		200,000	200	240	300
0000	460.	211,600	225	270	325
		250,000	250	300	350
		300,000	275	330	400
		350,000	300	360	450
		400,000	325	390	500
		500,000	400	480	600
		600,000	450	540	680
		700,000	500	600	760
		800,000	550	660	840
		900,000	600	720	920
		1,000,000	650	780	1,000
		1,100,000	690	830	1,080
		1,200,000	730	880	1,150
		1,300,000	770	920	1,220
		1,400,000	810	970	1,290
		1,500,000	850	1,020	1,360
		1,600,000	890	1,070	1,430
		1,700,000	930	1,120	1,490
		1,800,000	970	1,160	1,550
		1,900,000	1,010	1,210	1,610
		2,000,000	1,050	1,260	1,670

1 Mil = 0.001 inch.
Varnished cloth insulated wires smaller than No. 6 may be used only by special permission.

b. Exceptions to foregoing table:
—Circuit conductor of No. 14 is considered to be protected by a 20 ampere fuse, if the voltage is less than 125 and the circuit rating is 1320 watts (large chandeliers, outline lighting, signs, theatres).
—Fixture conductor of No. 18 is considered to be protected by a 10 ampere fuse, if the voltage is less than 125, or by a 6 ampere fuse if the voltage is between 125 and 250.
—Fixture conductor of No. 12 is considered to be protected by a 35 ampere fuse of a 4000 watt circuit.
—Organ cable conductors of No. 26 are considered to be protected by a 30 ampere fuse.
—Motor circuits may be protected by breakers set not more than

30 percent above the rating given in the table.

—See Cars, Code No. 40.

2. Bare

Usually rated, for copper, on a basis of from 1200 to 1500 amperes per square inch.

3. Special Requirements

a. Circuits generally: Not less than No. 14.

b. Arc lamps: 50 percent excess capacity required.

—Stranded conductors for sizes larger than No. 14.

—Stage pocket leads, at least No. 6.

c. Cars: See Code No. 40.

d. Car houses: See Code No. 41.

e. Cranes: Circuit conductors, at least No. 12.

—Collector wires, No. 6 for 0-30 foot spans, No. 4 for 31-60 foot spans, No. 2 for spans over 60 feet.

f. Elevators: Control cables, at least No. 16.

g. Fixtures: At least No. 18.

h. Grounding: D. C. system, a current capacity not less than 1/5 that of the grounded conductor at the point of attachment, and never smaller than No. 8.

—A. C. system, as for D. C., but conductor need not be larger than No. 0.

—Lightning arrester, at least No. 6.

—Radio, periphery of cross-section of conductor to be not less than ¾ inch.

—Service conduit, at least No. 8.

—Equipment:

Capacity of nearest cut-out protecting the equipment.	Required size of ground conductor.
0 to 100 amperes	No. 10 B &S gage
101 to 200 amperes	No. 6 " "
201 to 500 amperes	No. 4 " "
501 amperes and above	No. 2 " "

"With portable equipment protected by fuses not greater than 10 amperes, No. 18 B. & S. gage ground wire may be used."

"The ground conductors must be at least equivalent to No. 10 B. & S. gage copper (where largest wire contained is not greater than No. 0 B. & S. gage) and need not be greater than No. 4 B. & S. gage (where the largest wire contained is greater than No. 0 B. & S. gage), and for service conduit the ground shall not be less than No. 8 B. & S. gage copper."

i. Incandescent lamps: Stage pocket leads, at least No. 12.

j. Motors: Conductors carrying current for only one motor must have a capacity of 110 percent of name plate rating. See notes under Code No. 8c.

k. Moving picture machine outlet: Not less than No. 4.

l. Services: At least No. 10 if soft drawn, or No. 12 if medium or hard drawn.

m. Three phase (not 3-wire): "Neutral must be of sufficient capacity to carry the maximum current to which it may be subjected."

4. Cables and Cords:

See Portables.

XVI. CONDUIT WORK

See Wiring Methods.

XVII. CONSTANT CURRENT SYSTEMS

See Series Arc Lighting.

XVIII. CONSTANT POTENTIAL SYSTEMS

The subject of Classes A, B (except series arc lighting), C (except series arc lighting), D and F of the National Electrical Code.

XIX. CRANES

1. Wiring

a. Insulation: Rubber, except where subjected to severe external heat and not exposed to weather, in which case use slow-burning.

b. Not smaller than No. 12.

2. Collector Wires

a. A strain insulator at each end.

b. Support so that "even with the extreme movements permitted the wires will be separated at all times at least 1½ inches from the surface wired over."

c. Main collector wire carried along runway: Support at intervals not exceeding 20 feet and separate at least 6 inches when run horizontally; if not run horizontally, separate at least 8 inches; when spans are longer than 20 feet, increase the distance between wires; no span may be longer than 40 feet; protect by cutout and control by switch (both conveniently accessible).

d. Bridge collector wires: Support on insulating saddles at intervals not exceeding 50 feet if the span is greater than 80 feet; separate wires 2½ inches or more.

e. Cab crane: Protect leads from main collector wires to each motor by cutout and control by switch (both readily accessible to operator).

3. Controllers

a. Install as required for a rheostat, except that where wires between resistance and contact plate are exposed to the weather, or are cabled, use rubber covered wire.

b. Inclose the resistance if the crane operates over readily combustible material.

4. Grounding

a. Ground motor frame, crane frame and track.

XX. CUTOUTS (AUTOMATIC)

1. At Service

a. In each undergrounded wire.

b. After the switch; and after the potential tap if a combined service and meter cabinet is used.

c. Inclose (including all live parts), if not located on a switchboard under competent supervision.

d. In private plants the leads from the yard wires are not classed as service wires, if proper cutout protection is provided at some point nearer the supply.

2. At Stations

a. At point of entrance or exit of feeders. "For outgoing circuits not connected with other sources of power, however, the protective devices may be placed on the supply side of transformers or similar devices."

3. At Generators

a. Not required for A. C. generators and exciters.

b. Not required between A. C. generator and a transformer operating together in one building as a unit.

c. Two-wire D. C. generator: Single pole protection is sufficient, if the cutout is actuated by the entire generator current and completely opens the circuit. "If a generator not electrically driven supplies a 2-wire grounded system, the safety device or devices must be so placed as to disconnect the generator from all conductors of the circuit."

d. Two-wire D. C. generator used with a balancer to form a 3-wire system: The cutout must disconnect the three wires.

e. Three-wire D. C. generator: A circuit breaker in each armature lead, actuated by entire armature current. "The safety

device must consist of either (1) a double pole, double coil, overload circuit breaker, or (2) a four-pole circuit breaker connected in the main and equalizes leads, and tripped by means of two overload devices, one in each armature lead."

f. "The safety devices above required must be so interlocked that no one pole can be opened without simultaneously disconnecting both sides of the armature from the system."

4. At Motors

a. In each conductor; if a circuit breaker is used it must open all conductors simultaneously, except that for D. C. and for single phase A. C. a single pole breaker may be used in each leg, or a single pole breaker in one leg and a fuse in the other.

b. The number of overload trip coils of circuit breakers must not be less than

System	Number of Overload Trip Coils
4 wire, 2 phase A.C.	2—(1 in each phase)
3 wire, 2 phase A.C.	2—(1 in each outside conductor)
3 wire, 3 phase A.C.	2—(1 in each of 2 phases)
2 wire, A.C. or D.C. ungrounded	1
2 wire, A.C. or D.C. grounded	1—(in the ungrounded conductor)

c. Circuit breakers: Accepted in lieu of fuses only when under competent supervision, or where required capacity exceeds 600 amperes.

d. An A. C. Starter may serve as a circuit breaker if when in the running position it automatically opens all conductors of a circuit and is equipped with the trip coils specified in paragraph b.

e. A D. C. Starter may not serve as a cutout if the overload release device is inoperative during starting of motor.

f. Continuous rated motors of over 2 h. p.:

—Fuses or thermal cutouts to be of rating (or next higher standard rating) equal to 125 percent of name plate rating.

—Circuit breakers should have a continuous current capacity at least equal to 110 percent of name plate rating.

—A circuit breaker of the time limit type should be set at not over 125 percent of the name plate rating.

—A circuit breaker of the instantaneous type should be set at not over 160 percent of the name plate rating.

—See note under Code No. 8c.

g. Continuous rated motors of 2 h. p. or less, and motors of other than continuous rating, are considered to be sufficiently protected by the circuit cutouts.

5. For Circuits Generally

a. Wherever size of conductor is reduced, unless the cutout in the larger conductor will protect the smaller.

b. For each group of small motors, small heating devices or incandescent lamps; or for more than 16 medium base sockets or receptacles or 25 candelabra base sockets or receptacles.

c. By special permission, 1320 watts (or 32 keyless sockets or receptacles) per circuit, if attachment of flexible cords is unlikely.

d. By special permission, for each group of mogul base sockets requiring not more than 4,000 watts—but only if sockets have no paper or fiber lining, if the attachment of flexible cords is unlikely, and if No. 12 wire is used in fixtures.

e. For each arc lamp, or series of arc lamps.

f. For each mercury vapor lamp, or series of lamps not exceeding five.

g. By special permission, for each group of mercury vapor lamps not exceeding 4,000 watts, where No. 12 wire is used in fixtures.

h. Sockets and lamp receptacles are rated at 40 watts for medium base and 25 watts for candelabra base, except for signs and outline lighting [where the rating supplied by the contractor is usually accepted].

6. Multipling of Fuses

a. Permitted, except for motor circuits, when

—the fuses are of equal capacity, and

—The fuses are as few in number as possible, and

—The terminals are mounted on a single continuous pair of substantial bus bars.

7. Fused Rosettes

a. Permitted in "large mills" only, and when

—Both poles are fused, and

—Cutouts in branch circuit does not exceed 25 amperes.

b. Rated at 3 amperes.

c. Fuse—May be link type for 125 volts.

—Must be of inclosed type for 250 volts.

8. Circuit Breakers

a. Setting must not exceed 30 percent above rating of conductor.

b. Overload release sometimes accepted as a circuit breaker.

c. Accepted in place of fuse only when under competent supervision, or where protection required exceeds 600 amperes.

d. Oil circuit breakers and switch must wherever practicable be isolated from other switches and electrical apparatus.

9. Warning

a. Readily accessible.

b. Not in a permanently grounded conductor, except that of ultimate 2-wire branch circuit for lighting.

c. Cabinet for link fuse, unless mounted on a switchboard.

10. Specifications

a. Fuses, see Code No. 68.

b. Fuse blocks, see Code No. 67.

c. Circuit breakers, see Code No. 66.

XXI. DECORATIVE LIGHTING SYSTEMS

a. As may be permitted temporarily, but only if the voltage does not exceed 150 and the wattage of the circuit does not exceed 1320.

XXII. ECONOMY COILS

See Resistance.

XXIII. ELEVATORS

1. Control wires, if free from mechanical injury and excessive heat, may be No. 16 and grouped or cabled, being taped (or corded) and painted for lengths less than 3 feet between motor and control panel, or for wires on back of control panel.
2. Cables for control and lighting: Flame proof covering.

—May be run open or outside of car.

3. Hatch limit switches in garages; at least 4 feet above lowest floor level.
4. Split tees and ells may be used for all circuits except feeders.
5. Conduit or armored cable attached to cars need not be grounded.
6. Strain insulators to be inserted in shifting cable, if latter is not grounded.

XXIV. EQUALIZERS

See Resistance.

XXV. EXTRA HAZARDOUS LOCATIONS

1. "All electrical devices and apparatus which tend to create sparks or arcs or which may ignite highly inflammable gas, liquids, mixtures and other substances must not be used in rooms or compartments where such materials are manufactured, used or stored in other than original containers, unless of a totally enclosed type especially approved for the purpose."
2. Vapor proof globes, guarded, for all lamps.
3. No motors or switches under any hood or in any vent pipe.

XXVI. EXTRA HIGH POTENTIAL SYSTEMS

1. Location: Power houses, substations, transformer vaults.
2. Voltage: Above 5,000, constant potential.
3. Requirements: Special.
4. Over 7,500 volts: Oil circuit breakers and switches to be of remote control type and inclosed in separate fireproof compartments.

XXVII. FIXTURES (Including Sockets and Lamp Receptacles)

1. Polarization

"Each fixture must be so wired that all inner screw shells of sockets having metal outer shells are connected to the same fixture stem wire or supply wire or terminal in the fixture, and this wire or terminal must be marked in an approved manner by which it may be readily distinguished."

2. Cord Pendants

a. Not as support for clusters.
b. Not in show windows, unless armored.
c. Not if voltage exceeds 300, except in car houses.
d. Strain not to be carried on binding screws.
e. Belmouth or bushing at metal cover of outlet box.
f. Insulating bushing at metal cap of socket.
g. Not where inflammable gases may exist.
h. Substantial guard where lamp is liable to breakage.
i. Special cord for damp places. See Portables.
j. "Lead wires furnished as a part of sockets and intended to be exposed after installation must be of approved stranded rubber covered wire, not less than No. 14 for medium base and No. 18 for candelabra base, and be sealed in place."

3. Chain Fixtures

a. Stranded conductors.
b. Not in immediate vicinity of especially inflammable stuff.

4. Rigid Fixtures

a. Not in immediate vicinity of especially inflammable stuff, if externally wired.
b. Watertight, if installed outdoors.
c. No splices in arms.
d. Rigid tube attached to hanger board, for series incandescent.
e. Ream all edges.

5. Wiring

a. Not over 300 volts.
b. Not more than one system.
c. No series lamps.
d. No electric gas lighting, except frictional.
e. External wiring so secured that it will not be damaged by pressure of the fastenings or the motion of the fixture.
f. Not smaller than No. 18.
g. Insulation: Fixture wire, 1/61 inch rubber for No. 18, and 1/32 inch for No. 16; flexible cord, 1/32 inch for either size; heat resisting insulation required where subject to excessive heat.
h. Flat canopy fixtures may be employed only where outlet boxes exist. Box and canopy must form an inclosure ample to accommodate splices.

6. Sockets and Receptacles

a. Classification:

		—Key—			—Keyless—		
	diam.	watts.	volts.	amps.	watts.	volts.	amps.
Candelabra	½ in.	75	125	¾	75	125	1
Medium	1 in.	250	250	2½	660	250	6
Medium	1 in.	660	250	6	660	600	
Mogul	1½ in.				1500	250	

b. "Receptacles having exposed terminals must not be placed in canopies unless completely enclosed in metal."
c. Weatherproof sockets for damp places or where exposed to corrosive vapors. "Unless made up on fixtures they must be hung by separate stranded rubber covered wires not smaller than No. 14 B. & S. gage which should preferably be twisted together when the pendant is over 3 feet long."
d. Keyless sockets or receptacles over specially inflammable stuff or where exposed to flyings of combustible material; "and, unless individual switches are provided, must be installed at least 7½ feet above the floor, or must be so located or guarded that the lamps can not be readily backed out by hand."
e. Specifications: See Code No. 72.

7. Insulating Joints

a. Must be used, unless
—The fixture and canopy are clear of metal, or of plaster on metal lath; or
—The screw shells of sockets are connected to the grounded wire of the circuit and the fixture is metallically connected to grounded equipment; or
—The screw shells of sockets are connected to the grounded wire of the circuit and the fixture is grounded by a separate conductor of not less than No. 14.
b. Canopies must be separated by firmly fixed insulation from metal or from plaster on metal lath, where insulating joints are used.

8. Supports

a. "For fixtures which are not attached to gas pipes or conduit unless outlet boxes or other approved fittings which will give proper support for fixtures are used, a ⅞ inch block must be fastened between studs or floor timbers flush with the back of lathing to hold tubing and to support fixtures. When this can not be done; wooden base blocks, not less than ¾ inch in thickness, securely screwed to lathing, must be provided."
b. "Studs which are not parts of outlet boxes, hickeys, tripods and crowfeet must be of malleable iron or other approved material."
c. Insulating tubing: Over gas pipes above insulating joint or blind hickey. If outlet tubes are used (as in Knob-and-tube work), they must extend below joint or hickey.

9. Specifications

See Code No. 77.

(To be continued.)

Building Permits and Their Relation to Construction Sales

The Following Instructive Article Was Prepared From Data Compiled by the Frank Adam Electric Company, St. Louis, Mo., and is Worthy of Most Careful Study at This Time

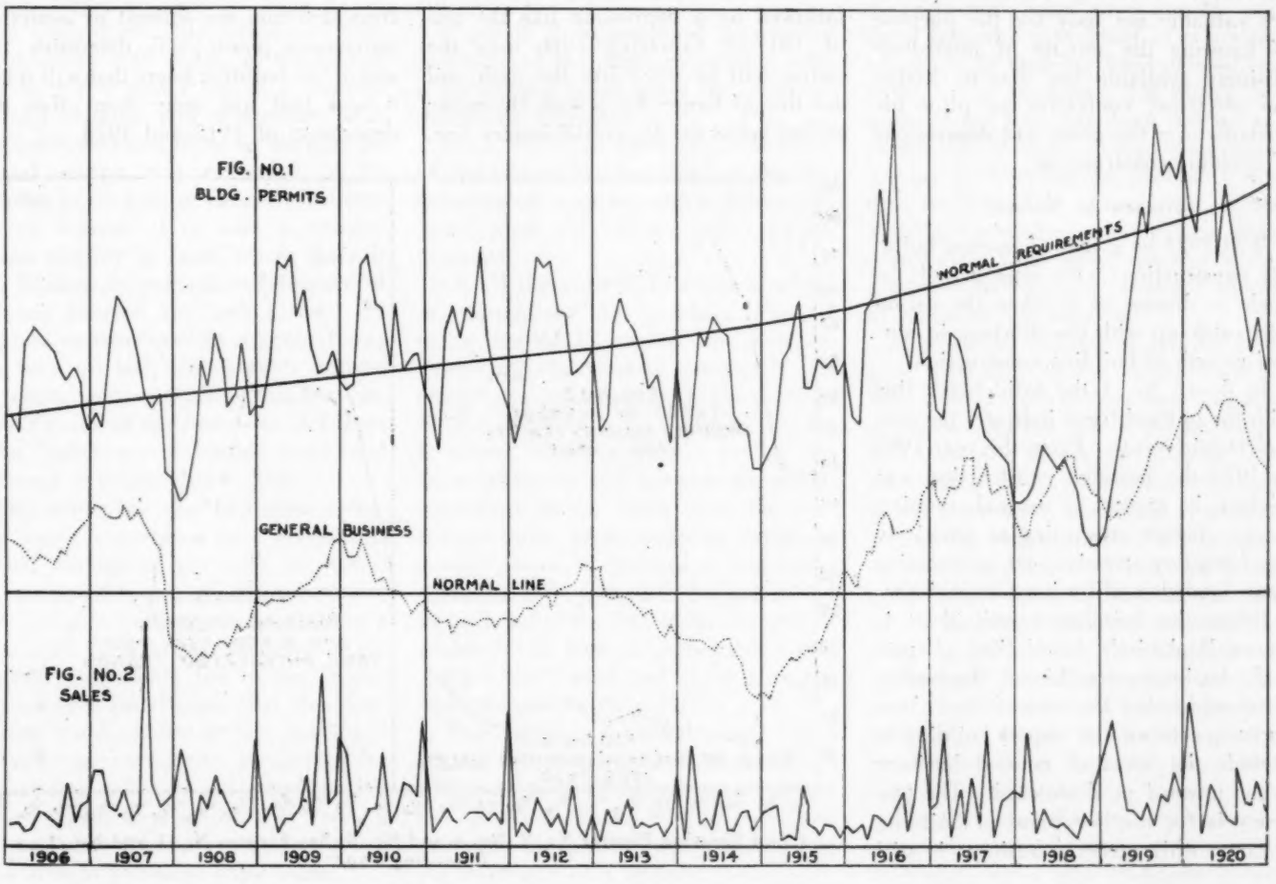
The electrical contractor may expect a normal amount of business from a normal year of building construction. Not since the year 1912 has yearly building construction reached the annual normal building requirements of the nation. Everyone realizes a large volume of building construction is awaiting the return to normalcy in the building industry. The amount of actual building necessary this year to catch up with normal growth and to supply the shortage of the past eight years is in the neighborhood of $3,500,000,000.00.

This article will be devoted to a discussion of two questions: First, to what extent may the electrical contractor go in analyzing the fluctuation of building permits, with relation to his business, and how reliable and dependable will his observations be? Secondly, when may he expect building construction to settle down to something like a pre-war normal basis?

In the first place the electrical contractor can obtain useful information from building permit data if he is familiar with the past record of his business. The experience of the writer in electrical contracting work has been limited entirely to house wiring for light and power and to a local territory. The records of this business gives a very dependable insight into the trend of sales when analyzed with building permits. The sales will follow the fluctuation of building permits with a lag of four or five months.

Figure No. 1 shows a chart of the fluctuations of building permits in 25 cities from 1906 to 1920. This chart is a very accurate indicator of building construction of the nation as a whole. The chart shows a clearly defined peak and depression for each year. The peak is near the middle of the year, usually in the first half, and the depression at the beginning and ending of the year. The general course being a steep rise from the beginning of the year until the peak is reached and then a gradual decline and the ending of the year in a depression. The year 1916 shows a peak much above previous years followed by two years of depression (1917 and 1918) and a peak of two years, (1919 and 1920) which will be mentioned again later.

Figure No. 3 shows the average amount of building permits per month for the period 1906-1920. Note the precipitous rise from January and February to April, when the peak is reached, and then the gradual decline to September and a small peak in October and a decline to December which is slightly higher than January. The years 1906, 1907, 1912, 1913 and 1918 conform very closely to the yearly average monthly trend. It will be noted, first, from the chart that the decline from the year's peak never takes the depression beyond February of the following year and, secondly, from the monthly



average permit curve that the totals for January and February are so close that the following conclusion may be reached: The average building permits for January and February is a good indicator of the coming year's volume of building permits. The monthly average will not fall below the January and February average and in normal times will be about 25% or more above.

Figure No. 2 shows the fluctuations of the billing of the contracting business of the Frank Adam Electric Company. While the peak and depressions are not as well defined they are the reverse of those of the building permit chart. Billing is the lowest in the middle of the year and the highest at the close and beginning of the year.

Figure No. 4 shows the average billing per month for the same period as building permits. Allowance should be made for the wide fluctuation between February and March. The company's fiscal year closes February 28th and billing that would have ordinarily gone with the first week of March has been crowded in on the last day of February. Following the peak of April building permits our billing reaches a peak in August and following the October building peak we have our billing peak in February. Building permit statistics are valuable not only for the purpose of knowing the amount of immediate business available but also to enable the electrical contractor to pilot his business over the peaks and depressions of building construction.

Return to Normal

Will 1921 be a year of normal building construction? No attempt will be made to discuss as to when the nation will catch up with the shortage in normal growth of building construction.

In figure No. 1 the solid black line with the upward trend indicates the normal requirements. From the year 1905 to 1913 the building construction was slightly in excess of normal requirements. Before attempting an answer to the foregoing question, let us examine some fundamental business conditions.

Below the building permit chart is shown Bookmire's dotted line of general business conditions fluctuating above and below the normal line. In a normal cycle we may expect building to precede the trend of general business either upward or downward. The tendency is for the low point of building to come while general business is still active and similarly a tendency for the high point of building to be reached before general business has reached its peak.

In 1907 the downward trend in building permits preceded general business and started up first in 1908 and reached a high peak in the spring of 1909 while general business reached its peak in the spring of 1910. Building permits held good in 1910 and 1911 when general business was below normal most of the time. Building permits began to recede after April 1912 followed by general business almost a year later. Building permits recovered before general business in 1915 and began to recede after the middle of 1916 and continued for nearly two and one-half years while general business was above normal. Building permits recovered first in 1919 and declined first in 1920.

Building permits for 25 cities show February permits 68% over January, represented by the solid line in figure No. 5. If there is to be a normal issuance of building permits for the year and using the January and February figures as an indicator the course will be something like the dotted line in figure No. 5 with December ending above the average January-February line. If the boom of 1919-20 is to be followed by a depression like the one of 1917-18 following 1916 then the course will be more like the dash and dot line of figure No. 5 with December ending below the January-February line.

Some further fundamental principles must be considered. A revival of business from a depression depends upon the ability to purchase and not upon needs. At the close of the World War, there was a great reserve of purchasing power that caused the rise of commodity prices to the heights of 1920. Men buy because they have the purchasing power, not because they need. They sometimes buy more than they need because they have the money and sometimes they do not buy at all, although they may need, simply because they do not have the money. Building construction is a permanent investment and it is natural for the investor to wait for a low point in prices of money, material and labor, which will be reached sooner in a depression than at other times. Large expenditures for new construction do not seem imminent as no general rush to make a permanent investment is likely as long as there exists the likelihood of a reduction in costs.

Building permits for 1921 will more likely conform to the normal trend as such building will be from sheer necessity and not from the normal needs of the investing public. When costs have reached a basis that will justify a permanent investment without a loss from deflation the amount of available purchasing power will determine the size of the building boom that will make a peak that will more than offset the depression of 1917 and 1918.

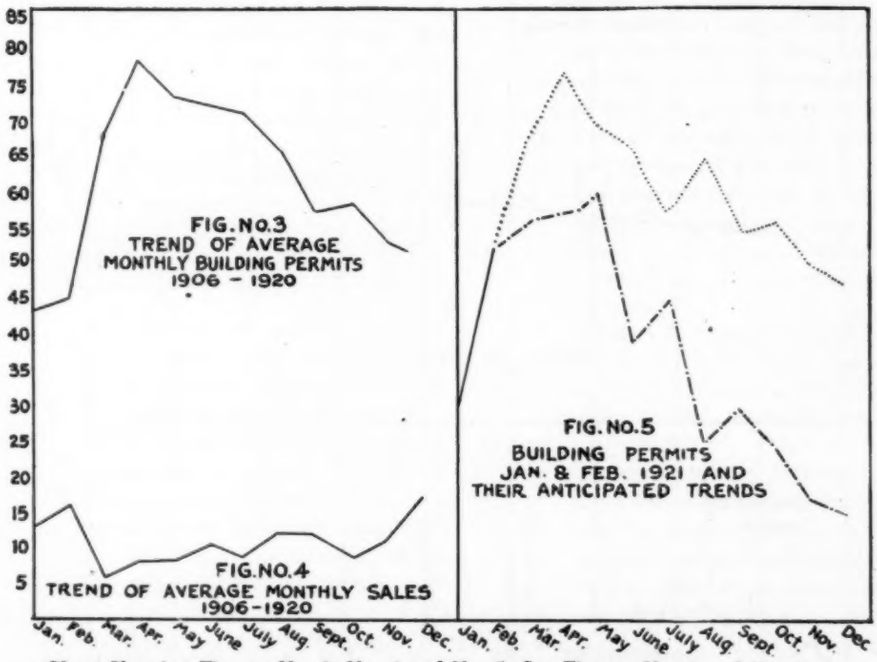


Chart Showing Figures No. 3, No. 4 and No. 5; See Figures No. 1 and No. 2 on Preceding Page

The Goodwin Plan and Its Effect to Date on the Contractor-Dealer

By Walter Hibbard

Paper Read Before a Meeting of the Electrical Contractor-Dealer Association at Fitchburg, Massachusetts

About four years ago the Goodwin Plan, so called because of the fact that it was conceived and in a very able manner advocated by Wm. L. Goodwin, became a more or less familiar byword to the electrical fraternity as a whole.

To my knowledge, up to this time there has been no particular criticism of the plan, from any source, either in detail or as a whole, and while I have not the space here, nor even the inclination, to discuss the entire plan in detail, I will say that in my opinion, at no time in the history of applied electricity, has any man or organization brought out a suggestive scheme or policy that contains such common sense ideas for the future, such workable and constructive policies for the present, and such simple and equitable remedies for the past and present wrongs of the business as a whole.

Having had an opportunity extending over a period of some six years to become quite thoroughly acquainted with the problems and desires of the central station, I feel that I am in a position to both criticise and sympathize with this institution and while in the past the central station was somewhat of an offender in the eyes of the electrical contractor, I know of no case at present, in our vicinity at least, where there is any friction or particular difference of opinion between the two forces. In fact the improvement in a general way has been marked, and benefits derived are almost immeasurable from the contractor's side of the fence—in fact there is no longer any noticeable fence, and harmony is nearly 100% high.

The writer has also had some seventeen years' experience as a contractor-dealer, attempting not only to always be in a position to serve the community in which his business is located, as a contractor, both in the handling of the smallest imaginable job to the largest construction installation that the community could require of him, making it not only unnecessary to go abroad for engineering advice and service, but demonstrating repeatedly, that from a point of view of results and costs, it was profitable to patronize home talent.

There is, however, one spoke in the wheel that is loose and squeaking, therefore not carrying its proportionate part of the load, or functioning in full accordance with the Goodwin Plan, and that is the so-called jobber, or wholesaler.

Quoting From Goodwin Plan

The basis of the Goodwin Plan is first, that each individual owes a responsibility to the organization representing his branch of the industry; second, that the organization owes a similar responsibility to its members.

Some of the desired results to be attained are: To produce harmony and develop coöperation between manufacturers, central station, jobbers and contractor-dealers; to produce greater efficiency in the distribution of manufactured products.

Plank 1. Free and unobstructed flow of trade along the most economic channels.

Plank 8. Recognition of the service functions of the contractor-dealer, with a differential based upon the value of the service rendered.

Plank 15. That the service functions of the jobber be recognized in the distribution of supplies, with a differential based upon the value of the service rendered.

Of all the various interests mentioned throughout the Goodwin Plan, I claim that the jobber, to date as an organization, has made practically no effort to properly recognize the position of the contractor, or function as the Goodwin Plan suggests; plying his trade wherever and however he might, regardless of the effect upon the contractor-dealer, from whom he expects a goodly share of patronage and upon whom he calls with such frequency and in such numbers that it has become a problem just how to accomplish a reasonable day's work and grant a courteous interview to them all.

The jobber, so called, has always abused the local contractor-dealer, is still doing so, and bids fair to continue the practice, unless the proper and necessary thought and effort are put into the right sort of a remedy.

The jobber has arranged his business in a way decidedly advantageous and profitable to himself, in that it is practically impossible for the contractor to get by him, so to speak, and purchase directly from the manufacturer, and this is the sole and only reason for the success of his fraternity. Taken as a whole, the caliber or type of man found at the head of a prosperous supply house is in no way superior to the owner or manager of a contracting business; on the contrary, as before suggested, his whole strength has been, and does lie, in the fact that he has built fences around himself and the manufacturer that are insurmountable by the contractor.

The Rise of The Jobber

The New England Jobber, in practically all cases, was originally a clerk in a store, with ordinary education, a limited amount of money, and plenty of room for brain development, and those few who may boast of a college education or training have entered the field, not as engineers, but purely because of the fact that there was no apparent way in sight whereby they might employ their money so profitably and with so little risk. Many men, to the writer's knowledge, of the first mentioned class, have grown wealthy in this protected buying and protected selling of electrical merchandise.

How do the failures of jobbers compare with the failures of contractors? Why do not more college men and men of means enter the contracting business? The questions answer themselves. The contracting game is a gamble every inch of the way; not a sure thing even at its best at the present time. Any contract may yield a profit or a loss, depending upon factors entirely beyond the control of the contractor, who is always the goat for the architect, engineer, owner, jobber, and the labor market; so what man of brains, money, or engineering knowledge, or all of these, cares to participate in a business so weekly founded and protected?

There is scarcely any contractor—I mean any properly established contractor—who could not exchange places

with the jobber and equal his record under his form of protection, but the jobbers are few indeed who could change places with the contractor and equal his record under the demoralized conditions that exist between the contractor and jobber, which the latter is largely responsible for and which he is making practically no effort—and certainly no concerted effort—to remedy.

The great majority of the material used by the contractor today must necessarily be purchased through the jobber. If you doubt it, send an order for a case of sockets, or what not, to a manufacturer, and listen to his polite reply: "Who do you want the goods billed through?"

Finds Easy Sailing

Very well, we don't object to that, but if this is a healthy state of affairs, and it is surely the bronze bottom unsinkable boat that the jobber sails in, why isn't it nutritous for the contractor-dealer as well? Why not, when the jobber receives an order or inquiry from our local customer for material which we have on our shelves available to him at an instant's notice at a fair price, doesn't he ask the customer who among the established dealers does he want the material billed through?

Recently I called at one of our wholesale grocery stores and asked if I could purchase a few boxes of cigars for holiday use and the answer was: "No, we only sell to dealers." I assured the proprietor that I honored him for his policy and only wished there was the same wise coöperation among the electrical trade.

In this city today and every day, on the shelves, in the racks, in the bins, is a very complete line of electrical material so far as variety is concerned, to the total value of not less than $50,000 to set it conservatively, and there is no excuse for users of material of this kind sending orders to Boston, as material can be delivered from these stocks immediately, at no greater final cost to the user than he pays eventually when it is gotten into his possession from the Boston jobber.

This desired policy on our part does not mean a restraint of trade any more than the incident of the cigars does. It is a wrong understanding of economy—it is a false impression created purely by the jobber, that any price quoted by the local distributor or dealer is higher than the same material can be purchased for from the big jobber, and he is the man who can and must correct it, either voluntarily or by being forced to by the members of the contractor association unfavorably affected.

There are ways of course to correct this undesirable condition, one of which would be a jobbing house owned and operated by the contractor-dealers of any state or section of the country. Why not? But it was not and is not my intention here to enter into any lengthy detail as to ways and means, but rather I had hoped and do hope to have this local organization use my paper as a topic for discussion at this meeting, which was the original and primary reason for asking members in rotation, to write and read papers.

I believe in this respect we have wandered away from the intent of the papers in the past and have devoted time and argument to matters of much less importance and less constructive in their nature.

Learning Your Grade

FROM PRINTERS' INK

One Hundred Percent Card of Cyclone Fence Company Enables Dealers to Find Their Standing

At least once a year the manufacturers and jobbers who go much into service work for retailers give their customers a good straight from the shoulder exhortation in the matter of taking inventory. The retailers are not only to count, measure or weigh their goods and put down conservative valuations for them, but also to examine their methods and everything having to do with their business— and to tell themselves the whole truth about everything.

It is true that many retailers—and many men in other lines of business for that matter—whose personal integrity is unquestioned, really do deceive themselves on many essentials. But the reason they dodge the truth can many times be traced to the fact that they do not know what the truth is.

The Cyclone Fence Company, of Waukegan, Illinois, in recognition of this latter principle has put out what it calls a hundred percent card which its retail customers can use in making searching self examinations which are good for their business souls. The card asks twenty-four leading questions and assigns a certain number of points for each which on a perfect score will run the total up to a hundred percent. The retailer is asked to put down his own conception of what his grade should be after each question.

Here are the questions as they appear on the card:

PERFECT		YOUR GRADE
6	Have you an up-to-date business and accounting system in your store?	
5	Is your business growing?	
6	Do you take an annual inventory?	
5	Do you figure selling price so as in all cases to guarantee you a profit?	
5	Can you state definitely what your overhead expense percentage amounts to?	
5	Have your sales reached a maximum for the expense involved in selling?	
3	Do you know what lines pay best and which pay least?	
3	Is your advertising campaign carefully planned ahead?	
3	Do you push nationally advertised goods?	
5	Do you discount your bills?	
3	Do you make special effort to sell the more profitable articles?	
6	Do you turn stock at least four times a year? (Allow 1 for one turn; 2 for two turns; 4 for three turns; 6 for four turns)	
2	Do you meet your customers personally?	
5	Do you buy from more sources than necessary?	
4	Are your windows regularly and attractively trimmed?	
5	Do you give prompt, courteous service?	
4	Do you and your clerks study the merchandise you sell? (Do you know how it is made and best talking points?)	
3	Do you make use of the manufacturers' free advertising cuts and other helps?	
3	Do you belong to the State Hardware Dealers' Association?	
6	Do you attend the meetings? (Allow 6 for any one association meeting regularly attended)	
3	Do you read at least three good trade journals? (Allow one point for each.)	
2	Have you a good mailing list?	
3	Do you use it?	
5	Do you have cooperation and teamwork in your store?	
100 Percent Total		Total Grade

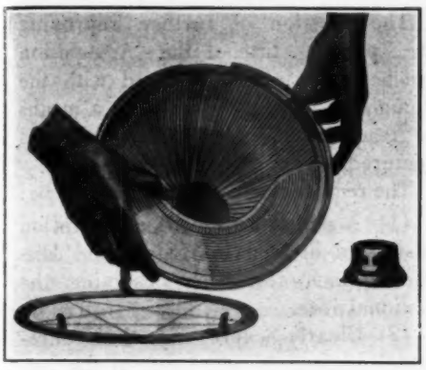
The information on the card is for the retailer's own personal information. But he can send it in to the company if he so desires. Some do. The cards are much in evidence at state and district hardware meetings. The dealers talk about their "grades" with interest second only to that shown by students in discussing the returns from the registrar's office.

Colored Light Arrives

It Gives the Contractor-Dealer a New Lead on the Subject of Store Illumination

Colored lighting effects are no longer the exclusive possession of large theatres and metropolitan merchants. The blaze of red or orange lights or blue-green moonlight has now arrived as a display medium for the small shop around the corner that sells gents' furnishings, for the variety store up the street and the enterprising hardware merchant, just as much as for the largest department store in town. Improved units now on the market afford a convenient means of throwing gorgeous hues over the display window. Here is an opportunity for the contractor-dealer. At the end of this rainbow is a pot of real gold—for the electrical man.

Just now, the trade papers which the



This Colored Lighting Unit Throws White Rays on Show Window Valance, and Tinted Light on Display, not a Solid Color. (Manufactured by the Holophane Glass Co., New York City.) Used by Courtesy of National Lamp Works, General Electric Co., Cleveland.

dry goods merchant, the furniture dealer, and all the other merchants scan, are filled with news articles explaining the use of these colored window lighting units. The small dealer has for several years past cast envious glances at the handsome windows, illumined with colored light, which have now and then appeared on Fifth Avenue or Michigan Boulevard. Lamp dip, and the old style gelatine films were too unreliable for the little fellow to play with. The news that simple color equipment is now available is good news for all.

And this interest on the part of the merchant in colored window lighting is good not only in itself but also because it may be turned by the electrical man into a healthy concern over window lighting and store lighting in general. There could hardly be a better lead than this to introduce the entire subject of store illumination.

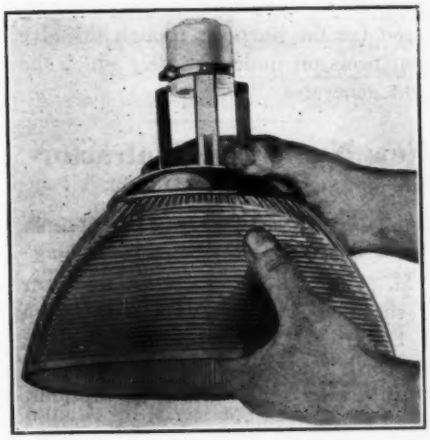
No great knowledge of color is necessary in handling a campaign such as this, but there are a few essentials which must be kept in mind.

Every now and then we hear of the man who tried colored window lighting and found that his yellow dresses turned green under a blue light, whereupon he promptly gave it up in disgust. That man knew very little about colored light.

This Opaque Reflector May Be Fitted With Gelatin Screen, Which Slides Easily into Place, and Gives Rich Glow of Color. (Manufactured by National X-Ray Reflector Co., Chicago.)

It must be expected that illumination of different hues will bring out different color effects in objects. The merchant should experiment with his displays until he learns what reactions he will have. But the color rays will enhance the beauty of the merchandise many fold if they are only used carefully.

The color of any object we see depends upon the light rays which travel between its surface and the eye. White light contains rays of all colors. We all know how it may be broken up into the various component hues by a prism, or by rain-drops, forming a rainbow.



This Reflector, and the Color Globe it Contains, Give a Brilliant, Diffused Illumination of Any Hue You May Choose. (Manufactured by Ivanhoe Regent Works of General Electric Company, Cleveland.) Photo Copyrighted by National Lamp Works of General Electric Company, and Used by Permission.

But a colored light, such as red, contains chiefly the rays of the one color. Under red illumination red objects appear to be exceedingly vivid of hue and orange, yellow and brown also gain in richness. When, on the other hand, green light, containing comparatively few red rays, is used, the red object becomes brown; orange appears to be faintly yellow, with a touch of green, and violet becomes brown tinged with bluish-green. If a light containing absolutely no red rays shoud be cast upon a red object, that object would appear to be black, for its surface would have the quality of absorbing all the hues of the spectrum excepting only red, and red being absent, in this case there would be no color reflected at all.

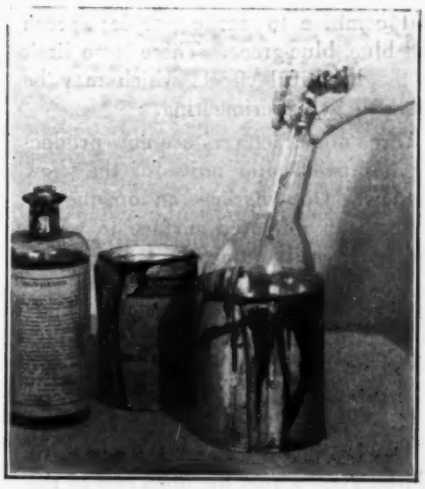
To emphasize the whiteness of goods on display, or to bring out the blues, the merchant will use a pale, blue-green light, which will contain very few red

Fastening the Frame for Colored Gelatin Screen on This Show Window Lighting Unit is a Simple Matter. (Manufactured by National X-Ray Reflector Co., Chicago)

or yellow rays. Slight rose and amber tints are valuable if lay figures are used in the window or if, perchance, a living demonstration is being carried on, for the human features acquire added charm under these lights. A simple rule is that light of the same color as the object, or of similar hue, increases the vividness of the hue, and that light of totally different color will entirely alter the color of the object.

The attention value of this flood of bright color in the window is of course immediately apparent to the merchandiser. A window filled with a blaze of red light takes the eye and holds the spectator far more successfully than a window full of red goods could possibly do.

The August fur sale window may be illumined with a blue-green glow which will make people on the sidewalk forget about the sweltering dog days—for colored light has a distinct effect upon one's sensation of temperature. In the dead of winter, the dealer can flood his



Dipping the Mazda in Dyes Which Come Prepared for Purpose. In the Past This Was Chief Method of Obtaining Colored Lighting Effects.

display of Florida beach apparel with orange light, produced by using amber screens on some units and red on others, and give shivering folk the cheerful delusion that the thermometer has suddenly gone kiting and summer has come once more.

Through long custom we have come to think of red always as the symbol of warmth, for it reminds us of the open fire. Blue is the color of the sky, and speaks of heavenly serenity. Brown, since it predominates in autumn foliage, seems to us sombre and suggestive of sadness and decay. Purple stands for royalty, perhaps because in ancient times this dye was hard to obtain and hence expensive. Yellow suggests gold.

Red, orange and amber are colors that excite. Blue and violet have a calming effect. Green, the color of nature, always seems restful to us. Colors play a larger part in our life than we realize.

It has been proved again and again, by the tests of phychologists, that people generally are very fond of the bright hues. We choose dull grays and browns and greens to live with because the gay colors are too stimulating for constant companionship, but occasionally, for enjoyment, we want a riot of red and gold and violet. The new colored lighting units give the merchant a wonderful opportunity to take advantage of this human preference.

By leaving one or two lamps bare, and covering others with the color screens, the color of the light may be made as soft or as intense as desired. If one lamp is bare while the others are covered with red screens, for instance, the effect will be pink. Red screens on some reflectors and green on others will give yellow; red and blue will combine to make purple; green and blue, blue-green. There is no limit to the beautiful effects which may be obtained by experimenting.

Three manufacturers are now producing improved color units for the show window. One markets an opaque reflector with mirrored surface to which one may easily attach a frame holding a sheet of colored gelatine, reinforced with a metal screen. Four colors are available, so that the pure colors or any blending of colors may be utilized.

Another unit, of prismatic glass, has an attachment for fastening a screen of colored glass across the open end of the reflector. A considerable percentage of the light from this unit escapes through the prismatic reflector, however, and is not affected by the color screen, and so the result is tinted light, rather than light of a solid color.

The third unit is also of prismatic glass, but is equipped with a special holder which accommodates a practically round ball of rich colored glass. A metal collar at the top prevents the escape of white light rays and the result is a light of pure color. For use in connection with this unit, there is provided an ingenious type of spotlight which may be attached to any lamp socket in the window, enabling the dealer to single out with a brilliant disk of white or colored light, any feature of the display on which it is desired to focus attention.

For emergency use, lamps may be "dipped" in dye which is specially prepared for the purpose, though this dye soon peels off under the heat which the light generates.

New Name for Contractor-Dealer

Acting on Suggestion Made in Last Month's Issue, Active Member Starts Something

M. G. Sellers, secretary-treasurer of the Pennsylvania State Association of Electrical Contractors and Dealers, sets forth some valuable suggestions in the following article which he captions, "Watt's in a Name:"

Analyzed, it is just some letters of the alphabet grouped together for the purpose of identifying you in the body politic, or in other words, getting your exact location in the course of human events.

A kid in a printer's shop took issue with this in arranging his own letters together for the first time, and wanted it distinctly understood that the completed composition meant him and "everythin' ".

If we combine this interpretation with a belief that civilization is organization, organization is coöperation, and we make progress as we learn to act in groups, we reach the problem of its practical application to business practice in identifying U S and "everythin' " electric.

In the reörganization of the Association, much stress was laid upon the word industry or a trade family proposition, ideal in its conception as an open forum for the study and cure of its various ills within safe lines of procedure applying to group formations, etc.

The question of further improving the present title of the Association reaches most executives, and with the thought of inviting criticism as a means of reaching a solution, this belief is ventured.

The requirements would appear to be:

(1) A nation-wide field of operation easily sub-divided into State and District branch formations carrying the National idea.

(2) Clearly expressing the educational advantages and value of the get-to-gether habit in exchanging business experience.

(3) Strongest possible use or application of electricity already widely advertised and the real keynote to all other requirements.

(4) Character of service rendered to the public.

In the minds of many members of the body politic today, the word "contractor" applies to such favored person or persons whose chief aim in business is to prepare and present a large bill for service rendered. Let's be sympathetic with the plumber, who seems to suffer most in this connection, although making little or no use of the word "contractor" as a part of title in group formations.

The word "dealer" is confusing and can mean a person who functions in a card as well as some other unpopular game, which by mere inference has an unfortunate place besides the word "contractor."

The following chart or schedule of available words will probably serve as a working base. Look it over and test out some of the possible combinations. If a better meaning of contractor-dealer is not there, let us go further:

Scope	Symbol of Unity	Trade Definition	Service To Public
American	Academy	Electric	Artisans
International	Affiliated	Electrical	Craftsmen
National	Allied	Electricity	Contractors
United States	Alliance	Electricians	Constructors
	Amalgamated	Electro	Dealers
	Assembly	Electrifiers	Employers
	Associates	Electric Service	Master
	Associated	Electric Industry	Merchants
	Association		Merchantmen
	Bureau		Servicemen
	Chamber		Tradesmen
	Club		Wiremen
	Company		
	Congress		
	Corporation		
	Correlated		
	Coordinated		
	Cooperative		
	Exchange		
	Fellows		
	Fellowship		
	Fraternity		
	Federation		
	Guild		
	Institute		
	League		
	Order		
	Society		
	Unified		
	United		

It is easily possible to improve this or arrange a similar schedule from a glossary of electric terms expressing, or nearly so, the four requirements mentioned, with the idea of conveying to and popularizing with the public the service rendered.

Many catchy selections can be thus made, such as "Fused Electric Units of America," "National Electric Ware and Wiremen," with opportunity to observe that being associated together we could be more extensively advertised as a select circuit of adjusters, fans or dynamos on service, good mixers and live wires in the uplift of the industry we represent, not forgetting that heat, light and power possess an intense human interest to every individual who reads, also those who unfortunately cannot.

Buffalo is Popular Convention City

More Than One Hundred Thousand Visitors Enjoyed Its Hospitalities Last Year

The National Association of Electrical Contractors and Dealers will hold its next annual convention at Buffalo, New York, next July, and judging from present indications there will be a large attendance.

The city of Buffalo has a very active convention bureau in connection with its Chamber of Commerce. In an official bulletin issued by that organization it is said that despite the high cost of travel brought about by the war, conventions continue to go to Buffalo in as great numbers as ever and the year of 1920 showed as many conventions held in that city as in any previous year since the convention bureau was organized.

There were 109 conventions held up to September of 1920, some of them having been booked in previous years, besides which there were 25 special events that took to Buffalo many visitors staying from one day to a week.

Such special events included the Canadian Lawn Bowling Clubs which played against the Buffalo lawn bowlers, the members of the Merchants' and Manufacturers' Association of Cleveland who spent a day there, and one hundred fire chiefs, members of the International Fire Chiefs' Association, who stopped over at Buffalo while on their way to Toronto. There were also a number of annual gatherings of the alumni of various colleges and universities, personally conducted excursions from western cities and a number of events of various kinds which took many visitors to Buffalo and resulted in favorable publicity regarding that city.

Another important convention was the Natural Gas Association of America. With this association there also met the Association of Natural Gas Supplymen, who conducted an exhibit of gas appliances of all kinds and whose exhibits and meetings were open to the public, the same as the Fixture Market held in February of this year. The number of registered delegates at this convention was approximately 2,000, many of them men of prominence and well known throughout the country.

The National Retail Hardware Association, while it brought a smaller number, was an important convention, bringing hardware men from all parts of the country. At the close of the convention the Chamber was informed that the meeting was the most successful ever held in twenty-one years and there was a larger attendance at the Buffalo convention than in any other city where meetings had been held.

July 18 is the date set for the National Association's big anniversary convention, and not only the old members, but the new ones are expected to be there. It is sure to be an event long to be remembered. An interesting program is now being prepared, which will be announced later.

Arrange to spend your vacation in Buffalo next July. Tell your friends about it. Let's make it the biggest convention of the kind ever held in the history of our organization.

Niagara Square, Buffalo; the McKinley Monument, and Portion of Business Section

A Critique on Critics

Speaking of critics, Ed. Howe, who publishes a weekly newspaper in Topeka, Kansas, says that we all devote too much time to criticism. He says it is foolish and unwarranted, and continues:

The word "critic" sounds well, but it really doesn't mean as well as it sounds. It describes, I sometimes think, the meanest trait in human nature. Don't become excited over your opinion that a certain thing is worthless. Your neighbor may like it; you are only one of millions of critics. Criticism has been overdone; it has become largely devilishness. The most merciless critic I ever knew—and, I may add, the ablest—has been a charge on the county many years, as an inmate of the poorhouse. And not a single one of those he criticized is in the poorhouse with him. But how mercilessly he flayed people who were really doing fairly well! Express your disapproval of bad actions certainly, but the man who makes a mistake of any kind will be punished; you needn't worry about that if that is your motive. And the critic who criticizes too much, is punished; never fear as to that, either. Insist upon the best possible service from the government, from the corporations, from every one; but, in the name of decency, do not make foul, untruthful charges against worthy men who are doing their best; who are really doing well; who are doing better than you are doing. The people have many sins to answer for, and they never sin so needlessly and viciously as when they are pawing the earth and bellowing as critics.

Electrical Devices and An Average Woman

BY C. L. KETCHUM.

She Is Not Familiar Enough With Modern Appliances to Know Them By Name and She Should Not Be Required to Guess

"I saw a window display this evening full of various electric devices. It was sort of hodgepodge, but interesting. The floor and walls were beautifully clean, which is more than you can say for the place across the street, as it is mostly chuck full of lamps. This window had a washing machine in the center.

"The current was turned on and the soapsuds were splashing up and down a circular rod of some sort. I knew it was a washing machine because there was a rubbing board attached at the upper right hand side. I don't know how much it cost or the name of it. A placard said it was eight dollars down and ten dollars a month, but it didn't say how many months. A man passed by and asked: 'Does that wash things?' and I told him it did. I knew more than he did anyway.

"Right in front was a beautiful percolator, or at least it looked like a percolator, only it had a spout in front like a soda fountain. Just imagine pouring unlimited coffee out of that lovely urn! It cost thirty dollars, but may be that price included the milk pitcher and sugar bowl and teapot that stood around it in a circle. They were all on a nice mahogany table, and they looked rather queer in front of the washing machine, but they were so bright and shining a lot of people stopped to look at them.

"Down in the corner was a sort of baby range affair with pots on it. I guess it is run by electricity and it must cost a lot. There was a placard inside it that I could only partly read. The price wasn't on it, or the name. If I knew what to call the thing I might have gone inside and asked questions, for it looked awfully interesting, just what I want in my new home, but how could I tell him what I meant unless I brought him to the window and pointed? Anyway I can't buy now and I wouldn't buy until I had seen a number of different kinds and knew how to choose. There are lots of vacuum cleaners and some aren't any good at all. You get the dirt all over the floor trying to get it out of the machine.

"I wish I knew the names of the different motors I saw on the floor and the dearest little curling iron was tucked in something that looked like a flatiron stand. They could just as well as not have put the name on that. The price was tucked in some way so I couldn't read it though I looked at all angles. And there was the dearest baby lamp, with a little eye shade thing on top, and a big tall lamp, something like the one I saw down town. I wonder if it is the same price. Believe I like this one the best. No, I haven't time to go in. I pass this window every day anyhow, and I'll go in some time maybe and ask the names of things.

"And I love that washing machine. It looks so nice and sudsy as though your clothes just had to get clean, but I don't think I'd have to use that washboard. Or was it a washboard? Perhaps it was just a wringer. There were so many things in the window I can't remember. But they all looked so efficient, just what I want. I'd a whole lot rather not have a servant, but do my own work and buy all the labor saving devices. I suppose prices vary.

"There were flat irons too, but they were different sizes. I wonder if they all belonged together, and were some cheaper than others, and how do you know when to take them on and off? I simply must go in and ask questions, but I don't know where to begin, and I don't even know what it is I want to ask about."

Too Much of a Display

The above is a sort of condensed report of a real conversation. The woman in question may be a little more helpless, a little more ignorant, and a little more timid than the average, but it is safe to say there are numerous women like her. Note that her chief grievance wasn't that there were so many objects in the window that she couldn't make up her mind what she wanted. She practically wanted everything she saw and was shortly to do considerable buying along this line.

Had the store in question had a neat placard above every article in the window, giving in clear letter the name and the price, she would have had something definite to go by. If she wanted to ask question she would at least have known the name of the article she wanted to ask questions about, and she would have known whether the price was at all within her means. Also while a price may be standard women like to compare prices anyway.

There is nothing whatever to be lost by having a price tag visible. A few may be scared away by the price, but if women want time saving devices at all, they are going to buy them price or no price. If their means are limited they will save up and buy gradually. But they will buy at the store which makes it easiest for them to buy.

All Strange to Her

The average woman is not at home in a store selling only electric devices. She is or feels as helpless as a man in a millinery store trying to buy ribbon to match his wife's hat. But the milliner knows the man is helpless and she acts accordingly, and the man knows she will give him the right ribbon at the right price.

The woman shopping for electric devices knows only that she herself doesn't know anything; that she does not want to buy just yet; and that she hasn't the courage to let the salesman get hold of her, talk for half an hour, and then turn and walk out of the store.

Another thing: If the articles displayed in the window are described in booklets, it would be a good idea to have the booklet attached by a small cord to the article along with the price tag. Most any woman, no matter how busy, how timid, or how uncertain about buying, can and invariably will enter the store, give the name of the article or articles she is interested in, ask for the booklet, and leave. Once she has read the booklet and feels that she can ask intelligent questions, she won't be so hesitant about entering the store and listening to the salesman.

Telephones Then and Now

It is said that there were but 778 telephones in use in the world 43 years ago, and that, according to the United States government census, there were more than 12,000,000 telephones in use in the United States alone in 1919.

Ask National Headquarters about the New Business Record.

·CONTRACTING·

A Department Devoted to the Study and Discussion of the Practical Problems of Electrical Contracting

ALLAN COGGESHALL Associate Editors HENRY F. RICHARDSON

(Power Panels—Continued)

The type of power panel frequently known as "Polarity" type panel readily lends itself to the space conditions available. As shown in the accompanying schedule and illustration the three phases may be arranged in tandem one above the other, thus making a long narrow panel. One or two of the phases may be placed side by side, separated by a barrier and the fuses of the third phase placed at right angles to those of the other two.

These panels may likewise be equipped with main switches if desired. Of course this adds to the expense and does complicate the bus arrangement to some extent. These panels also permit of simple arrangements for introducing of testing instruments as is sometimes required for periodic tests in industrial plants. In fact, once the fuse gaps and polarity idea is accepted as offering the proper amount of protection, the combinations that are possible are very considerable and a very flexible system of panel arrangement is thereby established.

This same polarity feature is just as applicable on three to two circuits, also on two to two wire circuits, but only when fuses alone are deemed sufficient provision for the branch circuits. In other words this type of panel commends itself most to cases where the panel may be classified as a centre of distribution rather than an operating panel.

It is evident therefore that it is almost impossible to discuss power panels without taking into full account the wiring distribution system also.

It is interesting to note, in this connection, that in the development of systems of distribution for industrial plants, where the power work is a considerable item, that this very development is tending to simplify the power panel requirements. The use of group power mains, for example, recognizes the opportunity of using the principle

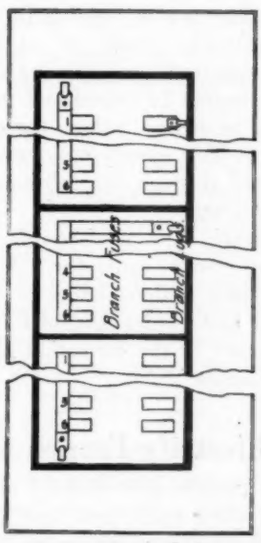


FIGURE "A"

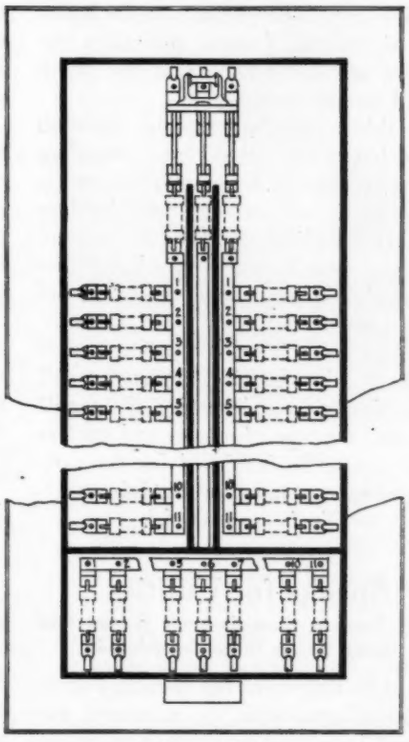


FIGURE "B"

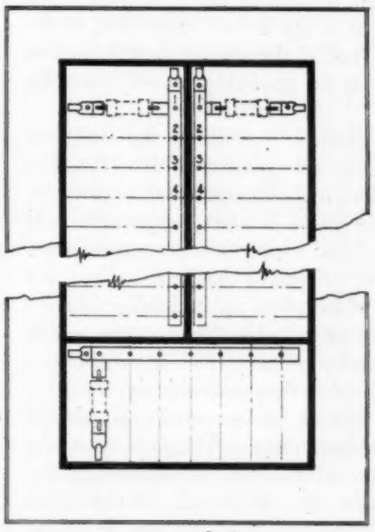


FIGURE "C"

Panel Mark & Designatn	Num Req	Size of Main Sw	Size of Main Fuses	Size of Main Lugs	Branch circts. Fuses only. 600 A.	400 A.	200 A.	100 A.	60 A.	30 A.	Size of Panel W.	H.	T.	Size of Pan Box W	H.	D.	Gutter Size of Top	Bottm	Left	Right	Metal Gauge Box	Door & Trim	Type. Sf. Cabinet	Voltage Supply	Fig.	

Showing a Possible Arrangement of Schedule for Listing and Ordering of "Polarity" Type Panels

of diversity factor of load to save copper. This may even result in the entire elimination of power panels, a number of such feeders being controlled at the main switch board in standard switch gear. Or a few such feeders may start at a centre of distribution panel which is in turn controlled by a single large feeder switched at the main board. In either case the protection of the ultimate device connected to the circuit is located at or near the device in the shape of fuses or relay and is not part of a panel board at all. The protection of such a group feeder whether it be fuses or oil switch or relay seldom operates, as the protection of smaller wires at the tap connections generally takes care of any trouble developing on the circuit.

It is an unfortunate fact that in a great many cases electrical power apparatus is specified or ordered by someone who knows very little about it. For instance, motors used to drive house pumps or sewage ejectors, etc., are generally ordered by a plumber. The plumber is very naturally perhaps more interested in the pump than in the motor driving it. If the pump comes with a motor which will make the pump operate, that is perfectly satisfactory to him. He sometimes has a vague general idea that a starter of some sort is required, but if the starter should be lost in transit he probably would not miss it.

The result is that unless the electrical contractor or someone else familiar with electrical apparatus takes some interest in these matters, apparatus will be furnished which in many cases is not suitable. A motor that is suitable for a device which picks up its load gradually may not be suitable for a motor which starts under a heavy load or on which a heavy load is thrown suddenly.

The choice of a starter is almost equally important. There is also the character of the electric service in the building to be considered. If the lights in an office building are on the same lines as the power, excessive starting currents should be avoided, while in other installations this is not so important. The character and capacity of the service to the building should also be considered. For instance, an excessive starting current in a single large motor may affect the lights in other buildings in the vicinity, in which case the lighting company will be likely to insist on a change in the motor. Also if the service lines are of small capacity it may be found impossible to start a motor which would start on a line of greater capacity.

Several years ago in a large building in a small city near New York, a centrifugal house pump was furnished with a squirrel cage motor with resistance type starter. This outfit had to be changed later for many reasons.

This pump was in the basement and pumped to a tank on the roof. A check valve in the line held the water in the pipe when the pump was not running. When the pump was started the motor ran away with very little load until sufficient static head was developed in the pump to open the check valve. Immediately a load was thrown on the pump. This occurred at possibly one half the normal speed of the pump and before torque enough had been developed to do real work. An inrush of current of about four or five times the normal running current was the result. This was bad enough, but if the voltage of the line could be maintained the pump would take the load and come up to speed. However, the excessive current often caused such a drop in voltage in the service lines to the building, which were from a generating station of small capacity, that the pump would not operate.

In this particular case the situation could have been helped by a retarding device on the check to prevent opening until a static pressure had been developed corresponding to 75 or 80 percent of the normal pump speed, but the motor should have been of the wound rotor type.

Where there is no competent person in charge, the electrical contractor will be rendering a real service if he will look into the type of motors and starters which are to be furnished for the various power apparatus on this job.

(To be continued.)

Speaks for Utilities

Public Service Commissioner Brings Out Seven Points to be Considered

Paul P. Haynes of the Indiana Public Service Commission, in a recent address at Indianapolis, emphasized seven points which should be read by everybody in the electrical industry, as well as by the public:

"*First*: The average increase in utility rates during the past four years was substantially less than the average increase in the prices of the necessities of life.

"*Second*: During the past four years most utilities have earned less than a fair return upon their invested capital, and equity would seem to require that during the next few years of downgrade prices, utility companies should be permitted to recoup reasonable losses suffered in the period of upgrade prices.

"*Third*: Utility rates were not, and are not now, based on the peak of war and post-war operating costs and therefore a considerable reduction in commodity prices can occur before the average of prices generally reaches the piont in which utility rates, generally speaking, are now based.

"*Fourth*: There have been millions of dollars of deferred maintenance during the past four years which must now be taken care of.

"*Fifth*: $100,000,000 should be expended for additions and improvements in the next two years by the utilities of Indiana in order to give the public services which are vitally necessary to the industrial welfare, health, comfort and convenience of the people generally. Hundreds of millions are needed in other states. The public should know that these vast sums cannot be obtained unless the financial showings of utilities are such as to attract it in a market in which the world is bidding for money.

"*Sixth*: The credit of utilities has been impaired, and this vast sum of money cannot be raised and the public cannot be served unless the credit of public utility enterprises generally is improved through the medium of adequate revenues.

"*Seventh*: The welfare of the state and the country calls for a broad and sympathetic understanding of these important facts which should be of basic importance in the formation of regulatory policies."

To Electrify French Canals

It is proposed to electrify all French canals which carry over 2,000,000 tons of traffic per annum. Sections of various canals already electrified show that this program will mean a saving of about 1,500,000 tons of coal per annum. In 1920, French canals handled 96,518,681 tons of merchandise as against 52,428,400 tons handled in 1919.

During the war, 1,036 kilometers of French canals were destroyed. Since the Armistice, 1,017 kilometers have been wholly reconstructed. Further, of the 1,120 locks, culverts, etc., destroyed, 890 have been rebuilt.

Methods of Arriving at Labor Costs

By CAMPBELL HIGGINS

Estimator for Hatzel & Buehler, New York City, Presents Complete Schedule Which Should Be Carefully Studied by Contractors

Having been requested by the members of the Electrical Estimators' Association of Greater New York to submit a paper on Labor Costs with particular reference to the practicability of ascertaining such costs from actual operations, I take pleasure in submitting the following report which is based entirely on practical experience over a period of four years.

I do not claim that this system is entirely free from defects, and I am sure that many improvements will be made as soon as it comes into more general use, but I do wish to emphasize the fact that this method of arriving at labor costs is entirely practical and its use will result in the accumulation of extremely accurate costs in a convenient form, without appreciable expense.

We all know how often attempts along this line have been made, only to be abandoned, and I am sure that in most cases the trouble has been due to an attempt to obtain too many details or because the results were obviously incorrect.

The first step in developing a cost system of this kind is to find a practical and easy method of charging the labor to the desired operations or items. I have been asked repeatedly how I succeed in getting the foreman on the job to make the proper subdivisions of the labor, and before going further I will endeavor to cover this important point by describing exactly what the foreman does.

At the end of the day or the first thing in the morning when making up the payroll, the foreman notes on a slip of paper the total number of hours recorded in the time book for each class of labor. On a small job, for example, he would have:

Foreman 8 hours	$10.00
Wiremen 16 hours	18.00
Helpers 24 hours	16.50
Total	$44.50

The foreman then readily recalls that the two teams were working on branch circuit conduit the entire day and that he and his helper were laying out and marking centers on the floor above all morning, and during the afternoon he set the first floor panel box which took about one hour, and the remainder of the afternoon he and his helper were working on the two-inch conduit riser. Setting these items down as he recalls them he will arrive at the following figures:

½ in. and ¾ in. Conduit, Team 16 hrs.	$29.00
Laying Out Work, Foreman and Helper, 4 hrs.	7.75
Setting Panel Box (Light), Foremen and Helper 1 hr.	1.94
2 in. Conduit, Foreman and Helper 3 hrs.	5.81
Total	$44.50

The important part is now done and all that remains is to enter the four

Campbell Higgins

amounts under the proper item numbers in the book, at the same time recording the total payroll for the day under its own separate heading.

I have no desire to make this operation seem any easier than it is, but the example given is typical of most days on the average job. As a matter of fact a foreman will soon become familiar with the item numbers and will use them as a substitute for the descriptive matter together with abbreviations of the other words, and you can see that the amount of time involved is not serious. To make this task easier a rate card without fractions is provided, giving the amount for each rate from one to eight hours and for multiples of eight hours.

As a rule a foreman will have no difficulty in keeping the time for the number of men working directly under him, provided of course that he makes up his book daily. On an extremely large job the subforeman, or straw boss, is relied on for the subdivision of time for those working under him. This last method was used successfully on a job where from fifty to sixty men were regularly employed, each subforeman turning in his report daily to the time clerk, whose duty it was to make up the final sheet and submit it to the superintendent before entering in the book.

In actual practice I have found very few foremen who experienced difficulty with the task; in fact most of them will do the work willingly and in a very short time once they are interested and understand what is desired. However, until the foreman is thoroughly familiar with the system it has always been necessary to keep in contact with him, visiting the job occasionally to see that he is keeping his book along the lines intended.

I do not wish to create the impression that a foreman who is unfamiliar with the method will obtain the desired results without any effort on your part. If you merely give him the list of items and a general outline of what he is to do you will certainly get a lot of costs, but the chances are that you won't have very much confidence in applying them to new work. It does not make so much difference how the costs are kept, but it is absolutely necessary that the man who is going to use the results be thoroughly familiar with the method used by the foreman in keeping them. For this reason the more nearly all the foremen work to the same system, the more usable will the results be.

Even on a job of moderate size a foreman is required to keep a good many records and he is prone to feel that any additional work of this kind is uncalled for. It is wise therefore to make his initial experience with this new idea a pleasant one. I have found that the best way to avoid the necessity of making corrections is to go to the job about two days after the material has arrived and start the book myself,

having some days previously discussed the matter in a general way with the foreman.

Knowing approximately what has been done to date you will be able to bring the record up to date by asking a few questions and letting the man do his own figuring. It will not require more than a half hour at the outside, and the result will be a very favorable impression on his part, for if five or six days can be disposed of in a half hour, one day will not be serious when taken alone.

The classification of labor cost items now in use is the result of numerous changes, and the unit labor costs now obtained on various jobs can be compared, and estimated labor units for new work readily applied.

The list of items submitted herewith covers practically any job, and I would like to point out the fact that not more than thirty or forty of these items will be required on any one job.

The total payroll charged to the job is divided into the following main subdivisions:

1. *Non-Productive Labor*: Covering all work which does not directly result in bringing the installation nearer to completion.

I have found that the best way to define this distinction is by stating that the item of *non-productive labor* covers all work which it *not* done with the tools or hands, while the *productive* labor *is* performed by men working *with* the tools or hands. For the purposes of cost-keeping, the labor expended on temporary light and power is regarded as non-productive, as well as the labor involved in tearing out work and replacing material already installed and previously recorded.

It will be obvious that an error would result from charging the cost of installing any material to the usual item a second time, for the reason that the unit costs are derived from the net amount of material used on the job, as will be explained later.

2. *Roughing (Or Conduit Work)*: This heading covers the entire cost of the pipe work, including panel boxes and pull boxes.

A glance at the detailed classification will show that the entire cost of installing the branch circuit conduit, including all outlet boxes, is kept as one item, and no attempt is made to arrive at the cost of installing an outlet box.

In this connection I would like to explain that all attempts to obtain costs on installing outlet boxes separate from the cost of conduit work have failed. Each foreman undertook to make the desired separation, but the results indicated that this separation was purely arbitary (for the reason that both operations are usually simultaneous), and therefore a wide variation in the cost of installing outlet boxes was recorded.

For this reason it was decided to keep the costs on this item in the only practical and sure way, and to record the length of conduit run between outlets of all kinds. In other words, to establish the average length of run between outlets, including ceiling outlets, brackets, switch receptacles, etc., as well as low tension outlets a difference of one or two feet in the average length of run between outlets will, under the same conditions, be reflected in a variation in the unit labor cost.

3. *Pulling Wire*: This heading covers the cost of pulling the various sizes grouped together, but not the cost of connecting, which is usually done at a later date and is more readily applied to the apparatus connected. The cost per thousand feet is recorded as being the easiest unit to remember.

4. *Switchboards, Panel Boards and Apparatus*: This heading covers the costs indicated, and on a job of moderate size the items under this group may readily be considered a part of the fifth and last classification.

5. *Connecting and Finishing*: No effort has been made to carry this list out to its logical conclusion. The items indicated will I am sure prove sufficient when taken in connection with the blank spaces.

You will note that the detailed list of labor items are so arranged that the unit costs arrived at in most cases correspond with the items of material appearing in an estimate, and are therefore convenient, as the units can be quickly applied by an experienced man, while the extensions can be made by any one. In this connection I would like to point out that ninety percent of the labor on the average job can be figured by the application of about two dozen unit labor costs, many of which do not tend to change with the various building conditions, and can therefor be used as standard in practically all cases; others will vary slightly within certain definite limits; while others, particularly the costs on conduit, will vary to a considerable extent. Where variations occur it will be found that some definitely known condition is responsible, and in many instances these conditions can be forecast with a fair amount of accuracy when figuring new work.

We will all agree that our work is mainly a matter of numerous repititions of very similar items, and for this reason it will be found that at least eighty percent of the labor on a job can be figured with only a very limited number of costs at hand, and if this part of the labor estimate is correct the chance of making a serious error in the remainder is extremely small.

Before closing I would like to give you a general outline of the points which must be taken into consideration in arriving at labor costs on the electrical installations:

1. The costs obtained must be approximately correct, and therefore both the intermediate steps and the final results must be readily subject to check.

2. The total labor charged to the job must be accounted for in arriving at the unit labor costs. Experience indicates that costs based on partial records are apt to be weighted and are therefore misleading.

3. The selection of items on which costs are to be kept must be made with due regard for the possibilities of keeping each item accurately and therefore no element of judgment on the part of the individual making the charges should be introduced, otherwise the personal equasion of the individual will make it impossible to use the results intelligently.

4. The items to be used, when once established, should be standardized so that the results on various jobs can be compared, improvements due to different methods of installations can be noted, and lastly for the reason that the various employes may become familiar with the system and may see that the results are obtained in the same way on all jobs.

5. The daily payroll must be divided and charged to the items selected by the foreman whose duty it is to assign the workmen to their daily work, for he is the only man who can know what each workman is doing, and therefore he is the only man who cannot dodge this responsibility should the accuracy of the results be questioned.

6. The items selected must be very clearly described and in sufficient detail to remove the possibility of misunderstanding on the part of the foreman, and blank item numbers should be

provided for the recording unusual work. It is much easier to add several such subdivisions if desired than to make an arbitrary division of one charge covering two operations. On the other hand, to provide a larger number of items than the foreman can readily become familiar with is unwise.

7. No attempt to record the material installed daily should be made for this method of obtaining the quantities has been found to be impractical, to consume an enormous amount of time, and the results are always found to be in error when checked at the end of the job. It will be found that the quantities can be far more readily and accurately obtained from the vouchers or invoices themselves, together with the credit slips. It will of course be necessary to obtain a few of the quantities from the plans or from the foreman, as for instance the number of outlets and general descriptions.

8. The final tabulations of the results should be performed by some individual, other than the foreman, who is sufficiently familiar with the job, to note any obvious discrepancy in the total amount of any class of material, and this individual should consult with the foreman and apply all possible checks in carrying out the work of tabulation.

9. The results should be recorded in an orderly and logical way for future reference and the quantities of material upon which each unit cost is based should be recorded so that a fair idea of the value of the unit can be had. Notes should also be made covering the type of building and floor construction, the general conditions experienced, the foreman's name, and the existing rate of pay.

10. Lastly, having used every possible means of getting the true cost and eliminating large errors, the results and the fact that they are being used, should be communicated verbally to the foreman who handled the job, for nothing will tend to produce interest in his part of the work so much as the knowledge that the results are of importance, and nothing will keep up his interest once he feels that the results of his work are not being used.

I have found it impractical to apply this system to more jobs than could be properly handled in the office, but have preferred to keep a smaller number of accurate costs rather than a larger number of records, the accuracy of which might be subject to serious doubt.

I am firmly convinced that the slight amount of time consumed in keeping the daily record is more than offset by an unconscious effort on the part of the foreman to make a good showing, to say nothing of the beneficial results of thoroughly knowing the conditions on the job and the possibilities of making improvements in the method of handling work.

No distinction is made between the work done under the contract and that done on extra orders if any are experienced, except where work is removed and replaced, the entire installation being regarded as a whole as far as costs are concerned. However, the proportion of extra work should be recorded as an explanation of the higher unit costs resulting.

I trust that the members of this association will become interested in the question of keeping labor costs and I strongly urge all of you to make a real effort along this line. The difficulties are not serious and the knowledge that you can price the various items in an estimate with definitely known labor costs gives one a most satisfactory feeling of confidence in the amount of labor allowed for the job.

HOW TO MAKE SCHEDULE

Use an ordinary cash book or account book ruled for dollars and cents and on the first page enter the total payroll for each day, giving the date. The amount should be taken from the time book.

Read the complete list of labor cost items, carefully noting the general groups and method of arrangement.

Having allowed sufficient space for the payroll, on succeeding pages open accounts for each of the nine items under NON-Productive Labor and all other items which are required on the job under consideration.

Use at least one page for each item and copy the title as well as the number at the top of the page.

Once each week add the individual items and compare with the payroll as recorded in this book, correcting any error.

Incorporate this list in the book and refer to it frequently. It will be found that a good way to index the book is to note the page numbers opposite item numbers on the list.

In making subdivisions of time it is generally sufficient to work to the nearest hour.

Non-Productive Labor

NOTE.—Under the first six headings record all time which is not of a directly productive nature. This generally includes all work not done with the hands or tools:

1. Erecting shanty, stock room, work benches, etc.
2. Clerical work—stock keeping—time keeping.
3. Running errands, etc.
4. Laying out work.
5. General supervision.
6. Handling materials, unloading, etc.
7. Tearing out work, and replacing any work or material already installed under this contract.
8. Temporary light and power.
9. (Blank line).

Roughing

NOTE.—Record all labor cost under the items given making no distinction between contract and extras. Material will be obtained from office records.

10. Installing ½ in. and ¾ in. Conduit CONCEALED, including all outlet boxes.
11. Installing 1 in. and 1¼ in. Conduit CONCEALED.
12. Installing 1½ in. and 2 in. Conduit CONCEALED.
13. Installing 2½ in. and 3 in. Conduit CONCEALED.
14. Installing 3½ in. and 4 in. Conduit CONCEALED.
15. Installing ½ in. and ¾ in. Conduit EXPOSED, including all outlet boxes.
16. Installing 1 in. and 1¼ in. Conduit EXPOSED.
17. Installing 1½ in. and 2 in. Conduit EXPOSED.
18. Installing 2½ in. and 3 in. Conduit EXPOSED.
19. Installing 3½ in. and 4 in. Conduit EXPOSED.
20. Installing hangers for main conduits.
21. Setting PANEL BOXES for lighting. (Give details).
22. Setting PANEL BOXES for power. (Give details).
23. Setting BOXES for motor switches. (Give details).
24. Setting cutout BOXES.
25. Setting LOW TENSION interconnection boxes.
26. Cutting chases for circuit work. (Give details).
27. Cutting chases for mains. (Give details).
28. Installing Metal Moulding, including outlets.
29. Correcting MANUFACTURERS MISTAKES in panel boxes, etc.

30 to 35. Blank lines.

Pulling Wires

NOTE.—Under these headings it is intended to record only the cost of pulling. If it is found necessary to include the cost of testing, splicing and tagging branch circuits, please note.

40. Pulling in No. 14 and No. 12 duplex.
41. Pulling in No. 10-8 and 6 single.
42. Pulling in No. 5-4-3-2-1 single.
43. Pulling in No. 1/0, 2/0, 3/0, 4/0.
44. Pulling in No. 300,000 and 400,000 cm.
45. Pulling in No. 500,000 and 600,000 cm.
46. Pulling in No. 700,000—800,000—1,000,000 cm.
47. Pulling in No. 18 and No. 16 single.
48. Pulling in special cables.
49. Running No. 14 and No. 12 single. Cleat Work.
50. Running No. 10, 8, 6 single. Cleat Work.
51. Running No. 5, 4, 3, 2, 1 single. Cleat Work.
52. Running No. 1/0 to 4/0 single. Cleat Work.
53. Running No. 300,000 and 400,000 cm. Cleat Work.
54. Running No. 500,000 and 600,000 cm. Cleat Work.
55. Running No. 700,000 to 1,000,000 cm. Cleat Work.
56. Running BX New Work.
57. Running BX Fish Work.
58. Installing crane trolley wires complete.
59. Installing crane trolley insulators and blocks.

60 to 65. Blank lines.

Switch Board, Panels and Apparatus

NOTE.—Describe fully the operation included under any item on which Costs are kept. Use blank spaces for further subdivision when desired.

70. Erecting and connecting lighting switchboard.
71. Erecting and connecting power switchboard.
72. Setting and connecting lighting panelboards and trims.
73. Setting and connecting power panelboards and trims.
74. Installing and connecting Motor switches 30 to 100 Amps.
75. Installing and connecting Motor switches, 200 to larger.
76. Installing and connecting Porcelain cutouts.
77. Installing and connecting Main Line cutouts. 30 to 100 Amps.
78. Installing and connecting Main Line cutouts. 200 to 400 Amps.
79. Installing and connecting Meter Boards.
80. Installing and connecting Service Switch.
81. Installing and connecting D. C. Motor Starters.
82. Installing and connecting A. C. Motor Starters.
83. Installing and connecting A. C. Motor Starters.
84. Installing and connecting D. C. Motors, 1 to 10 HP.
85. Installing and connecting D. C. Motors, 15 to 25 HP.
86. Installing and connecting A. C. Motors, 1 to 10 HP.
87. Installing and connecting A. C. Motors, 15 to 25 HP.
88. Installing and connecting Motor Generator set.
89. Wiring cranes complete.
90. Setting and connecting Transformers. (Give details).
91. Correcting MANUFACTURERS' MISTAKES in panels, etc.

92 to 99. Blank lines.

Finishing

100. Installing and connecting wall switches and plug receptacles, including plates.
101. Installing and connecting floor receptacles.
102. Installing and connecting Lamp receptacles.
103. Installing and connecting W. P. or special receptacles and guards.
104. Installing Exit Signs.
105. Making up and installing Drop Cords.
106. Hanging and connecting Fixtures.
107. Hanging and connecting Fixtures.
108. Hanging and connecting Fixtures.
109. Assembling and hanging Cooper Hewitts.
110 Tapping outlets.
111. Putting in lamps.
112. Fusing up.
113. Testing light and power circuits.
114. Painting.
115. Making splices in feeders.

116 and 117. Blank lines.

118. Installing and connecting Push Buttons (bell work)
119. Installing and connecting Bells 3 in., 4 in., 6 in.
120. Installing and connecting Buzzers.
121. Installing and connecting Gongs 8 in., 10 in., 12 in.
122. Installing and connecting Fire Alarm Stations.
123. Installing and connecting Telephones (single stations).
124. Installing and connecting Telephones (Intercommunicating).
125. Installing and connecting Annunciators.
126. Setting and connecting Interconnection strips.
127. Making up and installing Pendant gear pushes.
128. Connecting up Dry Batteries complete.
129. Connecting up Storage Batteries complete.
130. Installing and connecting Fire Alarm Control Board.
131. Installing and connecting Potentiostat.
132. Testing and adjusting low potential system.

133 to 140. Blank lines.

Mr. Abbott's Articles

Suggested Methods Will Benefit Industry But Can Be Used Only by Trained Estimators

A few months ago a series of articles by A. L. Abbott of the Electrical Construction Company, St. Paul, Minnesota, was published in these columns, under the title: "Improving Estimating Methods; Why and How". These articles created unusual discussion in the trade. The following comments come from M. H. Johnson, president of the J. & M. Electric Company, Utica, New York, and will be read with interest:

"Mr. Abbott is undoubtedly one of the best minds giving consideration to this very important topic. The great difficulty of making any constructive criticism on his methods has caused me to give the matter very careful thought. So far as I am informed the usual method of estimating electrical work consists in approximating the labor required for the installation of a certain number of outlets, taking this as a measure against the approximate cost of the material involved in the work. The figure ultimately used as the labor cost being that considered by the estimator as the proper amount.

"Mr. Abbott's method would in my judgment be of very considerable use to a trained analytical mind, but the intricacy of the plan it seems would prevent its general use by the very large majority of men who are called upon to make estimates. His division of factors is in the main correct, but a superbasis of ideal cost could be derived from four simple factors, namely, the number of feet of pipe or wire used; the size of the same; the number of outlets; and number of bends. The number of outlets per foot and the number of bends per foot have a definite relation to both the complexity of the work and the size of the area of work done.

"These four factors taken together with their proper constants could be made to give an ideal cost. This ideal labor cost would have to be raised to cover the handicap due to the general contractor's inefficiency, and the inefficiency of the electrical workers, and the general handicaps surrounding the job, such as location, etc.; and the handicaps by the electrical contractor's negligence in supervision or direction.

"All of these factors undoubtedly have their effect in increasing the cost of the work and the extent to which they increase the work must always be a matter of judgment by the estimator.

"Great benefit could, of course, result from determination of the factors to give the ideal cost. But it is obvious that great care and forethought would be necessary to procure these constituents in form so they could be generally used.

"Everyone who studies this question and writes as Mr. Abbott has, is doing his bit for the solution of a very complex problem. I hope the ELECTRICAL CONTRACTOR-DEALER magazine may be able to offer more studies on this subject, as it is worthy of all the attention that can be given it."

Estimating

BY A. GREENBLATT

Secretary of New York Association is Aroused by Abbott Articles on Same Subject

We are living in an age of specialization. The dentist can prove to you by a logical process that if you neglect your teeth you will get indigestion. The sky pilot will prove to you by all that is holy that if you don't go to church regularly your soul will go to hell. Some one should convince the electrical contractor that unless his estimates are based on true costs his business rests on a flimsy foundation.

We haven't as yet reached the millennium when we don't have to submit estimates to get contracts. But Mr. Abbott, in his paper on the subject, in the December issue of the ELECTRICAL CONTRACTOR-DEALER magazine, has made it very clear why estimating should be done on a scientific basis. If you haven't read that paper yet you could not spend a more profitable half hour. In fact you will have to do so to get a better understanding of the comments on it and the heated discussion it has aroused among estimators.

It required ages of scientific research to reach the present stage of development in industries, medicines, engineering, etc. But a start had to be made sometime, and those efforts were continued. We have now made a start on the systematic estimating of electrical construction costs. Let us devote some efforts in developing the subject, and to quote Mr. Shore in the April issue of this magazine, stop "guesstimating."

You may not agree with the Abbott method, nor with that of the New York Electrical Estimators Association. So much the better. Let us have your own. Join the Estimators Association of your city if there is one, or organize one if there is none. If you don't do your own estimating, wake up the one who does it for you. The success of your business depends upon it!

Improved Estimating Methods

BY M. P. BROWN

Study of System for Estimating Labor as Set Forth by A. L. Abbott in January Issue of This Magazine

The New York estimators feel that the formula for arriving at the job factor was originally one used for general contracting and that in the form as set forth by Mr. Abbott, it is not adapted for use in this section of the country.

A short study of the formula will show the maximum variation obtainable is 50%. Is the nature of the work in the Twin Cities such that this 50% will cover the extras? In this section of the country a variation of 150% is not infrequent.

The first item of the job factor is the "size of the building". In a letter to the writer Mr. Abbott states that "when the area of one floor is about 50,000 square feet, the slab work will be continuous; if the floor area is much smaller than this the crew will have to stop this class of work and most of them will leave the job."

A floor area of 50,000 sq. ft. is very much the exception in and around New York, and we find continuous operation obtains on considerably smaller areas. We further find that on some operations, even though the total area per floor will be of considerable size when completed, the general contractor will work but a section of each floor at a time. This leads to quite an item of uncertainty. We note that Mr. Abbott uses a constant with this factor. Why not multiply the value of the ordinates of the curve (see page 124, January ELECTRICAL CONTRACTOR-DEALER) by the constant and use the results directly as the ordinate value? This would simplify the calculation one step.

The second item of the job factor is the "complexity of the installation." The "scale of complexity" as given by Mr. Abbott covers a range of 10%. We do not agree that this range is suf-

ficient and suggest that this be made to cover a range of at least 40%.

The third item of the job factor is the "efficiency of the general contractor." In connection with this, Mr. Abbott, in his letter to the writer, states that this item is entirely dependent on the judgment of the estimator; and yet he uses a constant with this extreme variable. While we agree that the efficiency of the general contractor does have quite a bearing on the labor required, it is seldom, when figuring a job, that we know who is going to be the general contractor.

There are two other items which have a bearing on the labor, and which Mr. Abbott apparently does not take into consideration. These are the "spacing of the outlets" and the non--productive labor.

The spacing of the outlets is determined by dividing the total length of branch circuit conduit by the number of outlets. It is obvious that the cutting and threading, offsets, etc., vary directly with the number of outlets. There should also be some means of taking into account the number of pipe entrances in the outlets.

The item of "non-productive labor" is one which must be left to the judgment of the estimator, and in our experience it never goes below 12% and sometimes amounts to 33%. This item is divided as follows:

1. Erecting shanty, stock room, benches, etc.
2. Clerical work, stockkeeping, timekeeping.
3. Running errands, etc.
4. Laying out work.
5. Consulting with architect.
6. General supervision.
7. Handling material, unloading, etc.
8. Tearing out work, and replacing work or material under this contract.

The writer has changed the job factor, as given by Mr. Abbott, in an effort to meet the conditions existing in this section of the country and the New York estimators are making a study of it with a view to either adopting or completely rejecting the method. Below is given the job factor and tables of values which we have tentatively assigned to the various items.

Job Factor—A Plus B Plus C Plus D Plus E Plus 100

B—COMPLEXITY OF INSTALLATION

Small one story, simple layout	0
Warehouse, simple layout	0
Factory, light and power	5
Two or three story store, light and power	10
Office—upper floors typical	15
Large school	15
Large department store	20
Large hotel	20
Theatre	20
Church	25
Club House	30
Large Apartment House	30
Large Bank	30
Town Residence	35
Country Residence	35
Hospital	35
Factory, complex layout	40

C—SPACING OF OUTLETS

10′	Factor 40
12′	Factor 36
14′	Factor 32
16′	Factor 28
18′	Factor 24
20′	Factor 20
22′	Factor 16
24′	Factor 12
26′	Factor 8
28′	Factor 4
30′	Factor 0

E—PIPE ENTRANCES

1′	Factor 0
2′	Factor 4
3′	Factor 8
4′	Factor 12
5′	Factor 16
6′	Factor 20

A—Area of floor—use same curve as given by Mr. Abbott, using ordinate values of 0-25 instead of 0-10, and abscissae values of one-half the amount assigned by Mr. Abbott.

D—A variable of from 10 to 25 percent, to be left to the judgment of the estimator.

The writer feels that Mr. Abbott's system is a big step in the right direction and has taken the liberty of criticizing it simply with a view to arousing interest in the method. The values that we have assigned to the various factors are entirely arbitrary and may be changed greatly during our study. The members of the New York Association have been working on labor data for two years but with a view to gross units. Mr. Abbott's idea of using base costs with a variable job factor is a very necessary refinement and should meet with favor by all estimators.

Somebody Pays

Official Bulletin of Heating and Piping Contractors' National Association Believes Estimating Should be Direct Charge

Who pays for the "Estimates Cheerfully Furnished" that one meets with in the building industries? *Someone* foots the bill! Sooner or late *someone* pays for the many useless estimates made in all parts of the building industry. The final step of course is to collect it from the user of the building, whether he be owner or renter. *He* pays because he has no one else to whom he can pass the bill.

What do we mean by useless estimates?

Let's take a concrete case. The owner of a lot is planning the erection of a building. The heating plant will cost about $5,000. Instead of calling in some reputable contractor and giving him the job, after asking for an estimate if desired, Mr. Owner, Mr. Architect, or Mr. General Contractor, wanting plenty of information, invites and secures eight bids.

The arithmetic is simple. Say the average cost of estimating a $5,000 job is $30. Now eight times $30 is $240. But only one man can get the job. He charges the owner $30 for the expense of estimating. The wasted energy of the seven other concerns goes on the books as $210 added to the overhead of the heating business.

But the heating system is only one part of the building. The same condition exists in the other building trades. The amount grows rapidly when all the different lines are considered. By figuring the wasted energy in estimating on each of these parts of a building one can get a vivid picture of the source of one of the large items in overhead expense and an item which can truly be labeled non-productive effort.

What is the answer?

Consider the matter of estimating as a *Business Service*. Charge for it openly. Let Mr. Owner, Mr. Architect, or

"Mercy! What Struck the Scales?"

Mr. Builder have any number of estimates he desires. Make it one or a hundred but let him understand that the expense of estimating his job must be borne by that job and not by John Smith's job in the next block. Teach him the simple mathematics of the situation. If one estimate costs $30 and you wish eight estimates you should pay eight times $30, or $240.

It is only simple justice to have each job bear this expense rather than to leave it to a gambling chance to decide who pays the bill.

The accompanying cartoon was furnished by M. G. Sellers, secretary of the Philadelphia Association, also secretary of the Pennsylvania State Association of Electrical Contractors and Dealers. He uses it at meetings to illustrate a talk on the subject of furnishing free estimates.

Method of Grounding

[Excerpts from a paper read by Thomas Henry Day, E. E., New England Insurance Exchange, at the Electrical Conference in which inspecting, contracting, manufacturing and central station interests of New York, Connecticut, Massachusetts and Vermont were represented, in the Municipal Auditorium, Springfield, Mass., Wednesday, March 30, the paper being an analysis, paragraph by paragraph, of Rule 15A, the accompanying diagrams being reproductions of drawings, ten feet in size, prepared and used by Mr. Day during his explanation of the Rule. The Conference was under the auspices of the Western Association of Electrical Inspectors, of which Mr. Day is president. A similar Conference will be held in the Auditorium of the Travelers Insurance Company, in Hartford, Conn., Wednesday, May 18, which will be open to all interested in fire and personal accident hazards of an electrical nature.—The Editor.]

In view of the importance of protection against difficulty arising either in the fire or personal accident hazards, care should be taken to secure and to adopt the very best grounding medium, that the path to earth may be permanent, effective and of the lowest possible resistance. Because of the great difficulty in maintaining a low resistance path to earth at all times, my personal experience with artificial grounds have been such that I am urging the use of a system ground wire in such localities as are without water mains. As a general proposition, none of us can feel reasonably assured that the earth into which the grounding medium will be buried or driven, regardless of what form the medium may be, will be permanently moist. Soil conditions vary in different localities and soil variations, in the same locality, will be noticeable even from week to week.

Because of soil conditions I have had a number of discouraging experiences in localities where the soil was of clay or where there were but a few feet of earth over granite, slate and marble, where the few feet of earth, in season of drought, became hard and dry and of no value which would serve the combined purposes of protecting human beings and property against the personal accident and fire hazards.

In a word, I feel that when men like us are facing a personal accident hazard, the very best possible method, regardless of the initial cost, should be the method employed, remembering that a manufacturer of a device for artificial grounding, no matter how complete in detail his device may be, cannot convert with his device a mountain of granite, a hill of slate, a community of marble, or a valley of clay, but thinly covered with a strata of sand or loam, into a path for the easy flow of a vagrant current, to such a degree as will establish confidence as to safety for all time.

It will be noted that the Committee has suggested three methods for the protective grounding of alternating systems, but the use of separated multiple connections is strongly urged, wherever local conditions will permit.

We may attach the protective ground wire to a water piping system either at the individual service or near the transformer, or transformers, as the case may be. Connecting to the water piping systems is a practical and a reliable method to protect the low potential system against a rise of potential, due to exposure to the primary current.

In some localities there has been opposition against such practice on the part of the water works companies, such opposition being, I believe, the result of a general misunderstanding of the problem. Recently the American Water Works Association has endorsed the use of ground connections between alternating current secondaries and water piping systems. This attitude will greatly aid in securing reliable grounds, something not always possible to obtain and then to maintain, through artificial grounds when water piping systems are available.

Then there is the suggestion for the use of artificial grounds. The value of these, however, will be limited to the character and moisture of the soil in which they are buried or driven.

The third suggestion is the use of a system ground wire, which is sometimes used where there are no water piping systems. Multiple ground connections are preferable and are to be desired, but the alternating current secondary system should not be grounded within a building except at the point where such service enters the building.

Diagrams Explained

Reference to the accompanying diagrams A and B of the two and three wire systems will indicate the method for installing the ground conductors, more especially when there is but one ground on the secondary system. It is felt to be a bad practice to utilize a single ground wire for several classes of equipment. The loss by breakage or accidental disconnection of the actual common ground connection or the use of a relatively poor connection will tend to make currents circulate between the different classes of equipment. Particularly harmful would be the passage of current from a lightning arrester of large capacity over an instrument secon-

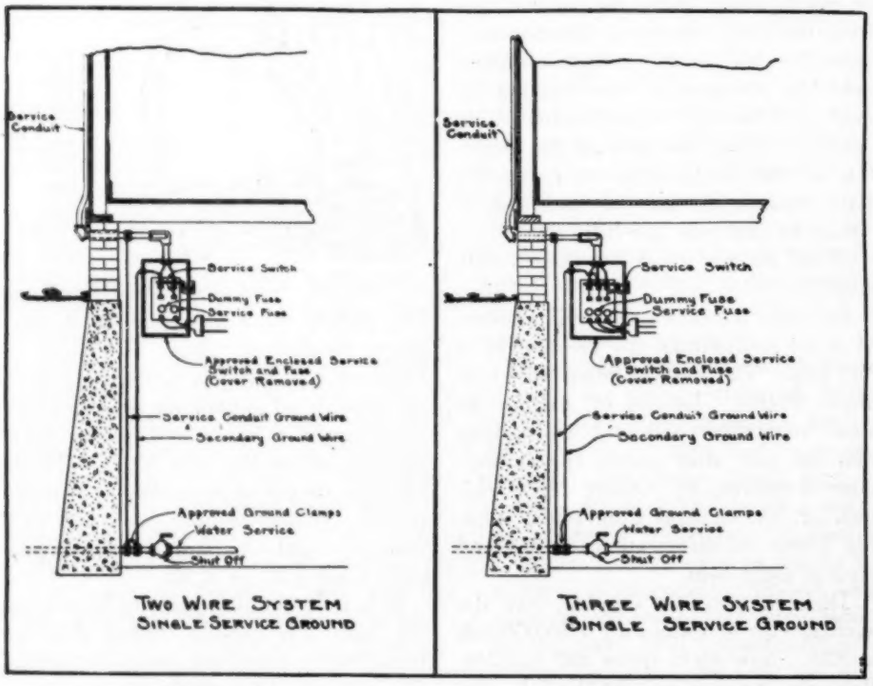


Diagram A Diagram B

dary or a low voltage distribution secondary which serves devices and is handled by many persons. The installation of the different ground wires radially to a common ground, or better yet, to different grounds, offers usually a greater degree of reliability and safety.

Some time ago it was the practice in many localities to use a ground wire from one of the service wires to the water pipe. To this ground wire were then connected wires from the service conduit, interior conduit, armored cable and similar systems, also utilization equipment, one grounding clamp, attached to the water pipe, serving the several purposes. Some clamps are weak in construction, as well as in principle and in design. With some clamps the lug, for the ground wire, is bolted to the clamp, making it possible for a loosening of the ground connection at this point.

It was brought to the serious attention of the Committee that some ground clamps had lamentably failed. You will recognize that with the several systems connected to one ground wire, or to the one clamp, should the ground clamp break down and the high potential current be one the secondary system, the service conduit, interior metal systems and equipment would then have the impress of the higher voltage, thus creating a very serious hazard, and because this did happen, the Committee felt that these systems should be separated by means of distinct and separate ground connections. In a word, the common use of a ground conductor for secondaries entering buildings, machine frames, electrical conduit, armored cables, metal raceways, fixtures, or other appliances within buildings is prohibited by both the National Electrical Code and the National Safety Code.

The possibility of removing a water meter for repairs or testing makes it advisable to have the ground connection on the street side of the water meter. In the event of the water pipe entering the building from the street, which is the general practice, and the electric service entering the building from the rear, as indicated in diagram C, it was the practice, under the former wording of the rule, to run the ground wire the entire length of the building, that it might be connected to the water pipe ahead of the main cock or meter. This frequently present an economic hardship.

Where there are "multiple grounds," that is, a number of grounds on the same secondary system, we may then connect the ground wire of the service and the ground wire of the service conduit to the water pipe nearest the part to be protected, provided we shunt all around the meter and connect all parts of the piping system liable to be physically disconnected. The chief consideration is to do anything necessary to maintain a continuous conductor or path to earth when you apply the advantages offered, in this paragraph, when there are "multiple grounds" on the same secondary system.

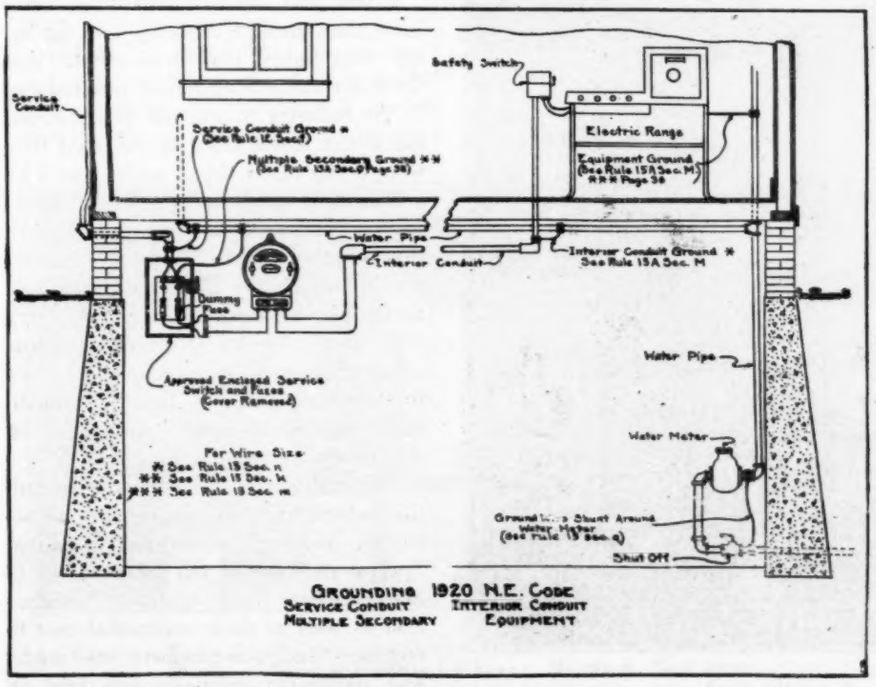


Diagram C

Change of Name

Contracting Company Also Opens Retail Electrical Store at New Address

Announcement has been made that the name of the Electric Construction Company of St. Paul, Minnesota, has been changed to the Commonwealth Electric Company. Arthur L. Abbott is the manager and the old organization remains unchanged.

Mr. Abbott is a member of the National Executive Committee of the National Association of Electrical Contractors and Dealers, and is also chairman of the Cost Data Committee of that organization.

On April 2 the Commonwealth Electric Company opened a new retail store for the sale of electrical appliances and materials. The new address of the store and office is 182 and 184 East Sixth Street, St. Paul, Minn.

Dealer Advertising

Instructions to dealers handling Royal Cleaners on how to build their own newspaper advertisements are the principle feature of the Royal Newspaper Ad Sheet which has just been issued by The P. A. Geier Company of Cleveland.

"It is the company's 1921 policy," states F. J. Gotron, general manager, "to aid the dealers in advertising themselves locally, in building up their individual prestige, and in making their stores the electrical headquarters of their particular communities."

In pursuance of this policy, the Royal Ad Sheet contains not only a certain number of "ready-made" newspaper advertisements for the dealer, but also brief directions as to how he may easily create his own ads. Suggestive paragraphs, phrases, and sentences which he may use are given, and cuts are supplied for this purpose. The sheet also contains a number of articles designed to be printed on the women's magazine pages of the newspaper.

The Western Electric Company in conjunction with the General Electric Company has organized a power apparatus class at the factory at Lynn, Massachusetts, to acquaint the members of its sales force with the manufacturing conditions which prevail in the production of motors, generators and the like. Classes are being conducted each month with an average attendance of fifteen salesmen.

·RETAILING·

A Department Devoted to Practical Suggestions that Help to Solve the Problems of Electrical Dealers

Westinghouse Merchandising Show

By J. E. Wilson

Secretary of Massachusetts State and Boston Associations Attaches Great Value to Exhibition

In my estimation the Better Merchandising Show staged by Frank J. Allen, sales promotion representative of the Westinghouse Electric & Manufacturing Company, supported in Boston by their special jobber, the Lewis Electrical Supply Company, with the Westinghouse Electric & Manufacturing Company and the Westinghouse Lamp Company, will prove of untold value in bettering the merchandising practices of all in the industry. The reason for my conviction of this fact is because in the course of the two hours necessary to go through the show, there are many valuable points necessary of consideration, not only brought to attention but actually shown how to overcome any practices in which we might be indulging which are not 100% efficient.

As the lecturer said: "One of the quickest and surest ways of overcoming a bad practice is to be made first to recognize it; second, be shown how to correct it; and third, to correct it."

He took up the importance of keeping books, mentioned particularly our Standard Accounting System and where and how it may be secured, establishing better banking relations and establishing a definite plan for handling deferred payments; showed us where we were overlooking a big bet in our show windows; proved their value and the fact that they were worthy of more consideration; showed how to build a fundamentally proper window; how to trim it effectively; how to illuminate it; what colors to use and not to use; how to surround the goods displayed with the atmosphere in which it would be used in the home. The same attention was given to the inside of the store, necessity of bringing the atmosphere and personnel of our stores up to par with the department store, neat and simple counter displays, showing the goods displayed in action through the aid of simple mechanical arrangements.

To me, holding the position as I do, and having the feelings of my fellow men so much at heart, I doubly appreciate the broad minded way in which the show was presented. It was truly an educational show for the betterment of all in the industry and not to further individual sales. Every suggestion and example set forth was as applicable to one line of manufacturer as another and in one way or another could be of value to contractor-dealers.

I feel that no one could possibly have gone through the show without being thoroughly convinced—first, that there are more than ample possibilities in the industry to warrant their becoming better merchants; second, that they were doing many things which could be a drawback instead of a help in becoming a better merchant; and third, through the sample window, constructive trimming and illumination as well as samples of store arrangement, carry with them a host of practical ideas which they could at once put into effect in their own business, thereby immediately improving their standing as an A-1 merchant.

The distinctive and detailed recognition which our association and its activities received was most pleasing. Special mention of our two courses in bookkeeping, their complete satisfaction as well as their contrasted cost to members and non-members was made, and particular emphasis was laid on

Example of Window Trim From Westinghouse

the value and importance of joining all of the various associations.

As I said before, this form of activity on the part of the manufacturer is without a doubt the greatest possible value, especially to the contractor-dealer.

Use Manufacturers' Ads

Represent Investment of Many Millions and Can Be Had for Almost Nothing

Clipping pages from the Saturday Evening Post and electrical trade papers is almost as good as clipping coupons.

That is, if you mount the pages you clip on neat cards and place them in your show window with some of the merchandise advertised.

Thirty-two manufacturers in the electrical industry spend over four million dollars every year through the magazines alone to attract the attention of the public, to interest them in their goods and force buying action when their interest has been aroused.

The merchant needs to spend but little time and effort in order to attract this trade to his store and cash in on the manufacturers' advertising.

Grey or other colored mat board, known as 10 ply, or even heavier, cut to required sizes, make excellent boards for mounting the magazine pages. If the pages are pasted on the mat board only at the corners they will not warp the board and are easily removed in order to place newer pages in their place.

Pages of advertising so arranged have the advantage of being separated from the other advertising and reading matter with which they have to compete in the magazines for the readers' attention.

Enough pages containing advertisements of electrical goods can be clipped each month to make the efforts pay well in dollars and cents.

There are many ways of making window displays with magazine advertisements. The window display shown herewith is a simple yet attractive display with plenty of good forceful selling value in it. It is a display suggestion by E. F. Newkirk of the Edison Lamp Works of General Electric Company, Harrison, N. J.

Another Pioneer Makes Change

After Twelve Years With Syracuse Concern, A. M. Little Connects With Philadelphia House

In line with plans to expand the wholesale end of its business, and to keep pace with its development, the J. F. Buchanan Company of Philadelphia announces the entrance into its organization as manager of the J. F. Buchanan Supply Company, of A. M. Little, who recently resigned as president and director of the Mohawk Electrical Supply Company of Syracuse, New York.

The J. F. Buchanan Company, composed of J. F. Buchanan and Gilbert S. Smith, has been in business thirty years, and it therefore is one of the oldest electrical concerns in the country. Under that name it operates a large electrical contracting business, and as such has installed some of the most important electrical installations in Philadelphia and surrounding country, particularly along industrial lines.

Some years ago it branched out into the electrical supply business, both wholesale and retail, the retail being the logical development of its contractor business; and to take care of this business, the J. F. Buchanan Supply Company was organized, and it is of this company that Mr. Little has become manager.

At 1715 Chestnut Street, in a modern four story building owned by them, is located their retail store. It is attractively appointed to properly display and demonstrate electrical appliances and supplies of interest to the consumer, and to exploit their use. At present their wholesale stock is in buildings at the rear, serving as a warehouse, but it is planned, under the supervision of Mr. Little, to secure a modern well appointed building in the wholesale district, into which the wholesale stock, offices, etc., will be moved and the jobbing business carried on. At the present location will be continued the retail, contracting and repair business, as a separate business under the name of J. F. Buchanan Company, buying as such from the J. F. Buchanan Supply Company.

Under such an arrangement the J. F. Buchanan Supply Company, in their relations with dealers, will have the great advantage of the experience of their own retail department to guide them in offering advice and service to other dealers, particularly as the policy of their retail department will be constructive and along the line of coöperation with others in exploiting the use of electrical devices and appliances.

Not being in any way affiliated with any other interest, the J. F. Buchanan Supply Company, in its selection of lines to carry, and policy to pursue, has to consider only its own interests and consequently those of its customers; and for this reason quality and service will continue to be of first consideration to it, in its dealings with manufacturers, as with its customers.

Mr. Little brings to the Buchanan interests a wide experience, as he has been in the electrical supply business since 1889, when he went with the Central Electrical Company of Chicago as office boy. He has therefore kept pace with the development of the business almost since its start. Twelve years ago he took hold of the Mohawk Electrical Supply Company of Syracuse, N. Y., then a small concern, and developed it into one of the largest electrical jobbing concerns in the country.

An Excellent Example of Contractor-Dealer Window Trim Suggested by Edison Lamp Works of General Electric Company, Harrison, New Jersey

Wiring Devices Can Be Merchandised

By W. D. YATES

From Talk of Mr. Yates at Merchandising Conference of General Electric Company and Eight Associated Companies

I must ask acceptance of the statement that wiring devices as a line can be merchandised. You will all admit that certain special devices like the Three-Cord Switch, or the Doubleduty Socket, or the Twin Plug can be merchandised. They can be all sold across the counter. Why? Because there is either a recognized or a very easily demonstrated demand for these devices.

And just as these special devices can be merchandised so can hundreds of other types of wiring devices be merchandised if their use is shown to the public.

Let us be specific—let's take a few instances of concrete sales which the contractor-dealer can make by using merchandising methods as applied to wiring devices.

A customer comes into the dealer's store and buys a toaster. Show that customer a Thru Cord Switch and explain that this device used on the toaster will greatly increase the efficiency and convenience of the use of the toaster. Point out that owing to the fact that it gives a flexible control of the toaster, you can turn the current off and on between slices of toast and save enough current in a relatively short space of time to pay for the device. You will sell a Thru Cord Switch to seven customers out of ten.

A customer comes into the store to buy a fan. Show him a Double Duty Socket. Point out the fact that he is able to use the fan in a socket without sacrificing the simultaneous use of the lamp.

A contractor-dealer in Indianapolis bought a quantity of General Electric Remindos, a combination buzzing and lighting system. He could not sell them until he connected one of them with the testing lamp receptacle that he used when people came into buy lamps. He placed the lamp in to see if it was all right. The buzzer began to buzz and a little explanation was all that was necessary. He sold all these Remindos that he had in stock and he is getting repeat orders for them. It is a merchandising opportunity. The point I want to make is that it is very often not necessary to show these devices to sell them.

How about the wiring job? The customer consults the distributor about a wiring job. There is an excellent chance to sell wiring devices, and if the contractor will sell wiring devices instead of a wiring job, that job will turn into a better one to the dealer, and in the long run give much more satisfaction to the man who is paying for it. Point out to the customer that in addition to the outlets required for lights there should be proper switch control of all these lights. Show him that in the hall—for instance, the upper and lower halls the light should be operated from three-way switches. Simply tell him that he wants to be able to turn the lights on from upstairs or downstairs.

There must be an adequate number of convenient baseboard outlets, and he must have those outlets in every room if he is going to enjoy fully the comfort and convenience of electricity. He may easily be persuaded that he wants to use a piano or table lamp. He may ask, "What do I want an outlet in the bedroom for?" Explain to him that the time may come when he may want to use a heating pad; sometimes people are taken sick. Point out to him that the cost of installing these outlets at the beginning will be less than if they are added later. Even the porch should have an outlet. Combined switches and buzzers should be installed in the cellar.

So I say that both the specialties and the staple types of wiring devices can be merchandised, and that a reward in the form of increased profits will come to the contractor dealer who does merchandise these goods.

Good Will Advertising

Reproduced From Three Column Newspaper Advertisement

The accompanying reproduction is taken from a series of fifteen advertisements that appeared in New York daily newspapers recently. The size of the original copy was six inches across three columns.

The United Electric Light & Power Company has been doing a considerable amount of good will advertising of this nature. Ralph Neumuller, advertising manager for the company, in commenting on these advertisements, says:

"They were intended to show the vital connection and great importance of central station service to many of New York's largest industries and indirectly to the public which these industries serve.

Reduced One-Sixth

"We have found that advertising of this nature creates a considerable amount of good will. It establishes a human bond between the public and ourselves and promotes friendly relations with our largest consumers who are, of course, appreciative of desirable reference to the importance and faithful operation of their business."

Electrical Advertising Exhibit

Plans are rapidly taking shape for the Electrical Advertising Display which The New York Edison Company is to hold in its Irving Place Showroom during the week of May 2.

Practically all the manufacturers of signs have accepted the invitation to take part, and an interesting exhibit of electrical advertising methods is sure to result.

Roof signs will be shown with their flashers in actual operation; store front signs will make up another part of the exhibit; and a third department will include the so-called directional signs.

An effort is being made to have an exhibit of some of the early sign material, and Major William J. Hammer, who as Edison's representative in London in 1881 built the first electric sign, has been invited to contribute material from his historical collection.

As 1921 is the fortieth anniversary of the making of the first sign, such an exhibit will add greatly to the interest of the show.

ORGANIZATION ACTIVITIES

A Department Devoted to the Reports of State and Local Meetings

STATE CHAIRMEN AND SECRETARIES

State	Chairman	Secretary
ONTARIO, CANADA:	E. A. Drury, 164 Oakwood Av., Toronto	J. A. McKay, 110 Church St., Toronto
BRITISH COLUMBIA:	E. Brettell, 781 Granville St., Vancouver	R. H. Hargreaves, Bus. Mgr., Vancouver
CALIFORNIA:	C. L. Chamblin, 643 Call Bldg., San Francisco	J. W. Redpath, 643 Call Bldg., San Francisco
COLORADO:	J. Fischer, Denver	W. A. J. Guscott, Denver
CONNECTICUT:	E. S. Francis, 272 Asylum St., Hartford	Geo. M. Chapman, 43 E. Main St., Waterbury
DISTRICT OF COL.:	Frank T. Shull, Conduit Rd. and Elliott St. Washington	H. R. Harper, 635 D St., N. W., Washington
FLORIDA:	T. E. Satchwell, Jacksonville	J. G. Spencer Palatka
GEORGIA:	Henry Morton 1227 Broad St., Columbus	C. B. Anderson Walker El. & Plain. Co., Columbus
INDIANA:	A. B. Harris, Gary	A. I. Clifford, 309 N. Illinois St., Indianapolis
IOWA:	Louis L. Corry, 510 Brady St., Davenport	F. Bernick, Jr., 208 High Ave., W., Oskaloosa
KANSAS:	R. M. Sutton, 125 N. Market St., Wichita	H. S. Lee, 816 Kansas Ave., Topeka
LOUISIANA:	C. S. Barnes, 513 Gravier St., New Orleans	R. S. Stearnes, 336 Camp St., New Orleans
MARYLAND:	S. C. Blumenthal, 505 N. Eutaw St., Baltimore	C. Philip Pitt, 15 E. Fayette St., Baltimore
MASSACHUSETTS:	Geo. B. Quinby, Boston	J. E. Wilson, 263 Summer St., Boston
MICHIGAN:	Henry Roseberry, 41 Pearl St., Grand Rapids	H. J. Shaw, 613 Lincoln Bldg., Detroit
MINNESOTA:	Emil Anderson, 240 Plymouth Bldg., Minneapolis	Roy Constantine, 2395 University Ave., St. Paul
MISSOURI:	W. J. Squire, Kansas City	A. J. Burns, 533 Delaware St., Kansas City
NEW JERSEY:	Geo. E. Davis, 23 Central Ave., Newark	Elmer D. Wilson, Newark
NEW YORK:	F. A. Mott, 29 St. Paul St., Rochester	J. P. Ryan, 26 Cortlandt St., New York City
OHIO:	C. M. Beltzhoober, 4th and Plum Streets, Cincinnati	Walter B. Keefer 939 E. McMillan St., Cincinnati
OREGON:	Roy C. Kenney, 388 Burnside St., Portland	F. R. Whittlesey 212 Henry Bldg., Portland
PENNSYLVANIA:	R. W. Keck, Allentown	M. G. Sellers, 1518 Sansom St., Philadelphia
TENNESSEE:	P. W. Curtis Chattanooga	J. A. Fowler, 10 S. Second St., Memphis
WASHINGTON:	S. G. Hepler	Forrest E. Smith, 205 Boston Block, Seattle
WISCONSIN:	B. L. Burdick, 72 Water St., Milwaukee	H. M. Northrup, 25 Erie St., Milwaukee

LIST OF LOCAL ASSOCIATIONS AND MEETINGS

State and City	Local Secretary	Street Address	Time of Meet.	Place of Meet.
ALABAMA				
Birmingham	--------	--------	Mon. Noon	Hillman Hotel
Mobile	E. J. Hueguenot	--------	Fri. 5:30 p. m.	Members' Offices
CALIFORNIA				
Berkley	J. M. Gregory	Pacific Bldg.	Fri. 8 p. m.	Pacific Bldg.
Covina	F. Rambo	--------	1st & 3rd Mon.	Ontario
Long Beach	O. W. Newcomb	308 E. 4th St.	Tues. Ev'g.	Spaulding's
Los Angeles	H. T. Muxall	628 U. Oil Bldg.	--------	Denver
Oakland	J. Gregory	Pacific Bldg.	Tues. 8 p. m.	Pacific Bldg.
San Francisco	A. Elpins	165 Jessie St.	Wed. 1:30 p. m.	165 Jessie St.
Van Nuys	Los Angeles Ass'n		Tues. 6:30 p. m.	Pin Ton Cafe
COLORADO				
Denver	L. B. Roberts	227 Coronado Bldg.	2d & 4th Tues.	227 Coronado Bldg.
CONNECTICUT				
Hartford	H. D. Hitchcock	45 Preston St.	Call of Sec'y	118 Asylum St.
New Britain	F. Mulvehill	--------	--------	--------
Waterbury	A. S. Jordan	Conn. Lt.& P.Co.	Monthly	192 Grand St.
DIST. COL.				
Washington	--------	--------	2d Thurs. ea mo., 8 p. m.	Dewey Hotel
FLORIDA				
Jacksonville	W. L. Joseph	155 E. Forsyth	1st Tuesday	208 Realty Bldg.
Miami	C. E. Pullen	Pullen-Zoll Co.	--------	--------
ILLINOIS				
E. Moline	E. J. Burns	Rock Island	--------	--------
Chicago	J. W. Collins,	179 W. Washington St.	2nd & 4th Wednesday	--------
E. St. Louis	O. J. Birmette	--------	Sat. 2 P.M.	Arcade Bldg.
La Salle	Ed. Blaine	--------	1st & 2nd Tues.	Post Hall
Rock Island	E. J. Burns	219 18th St.	1st & 3rd Mon.	219 18th St.
Streator	Wm. Schroder	613 Tyler St.	--------	--------
INDIANA				
Evansville	C. E. Jett	--------	Wed. noon	Y. M. C. A.
Gary	A. B. Harris	570 Washington	--------	--------
Indianapolis	G. L. Skillman	29 S. Capitol Ave.	1st & 3rd Thursday	Commercial Club
Warsaw	F. E. Strauss	120 W. Market St	Wed. Ev'g.	--------
IOWA				
Davenport	E. Burns	Rock Island	2d & 4th Mon.	Rock Island
Waterloo	J. A. Harleip	Care Waterloo Elec. Sup. Co.	--------	--------
KANSAS				
Topeka	H. S. Lee	816 Kansas Ave.	Mon. Noon	Elk's Club
KENTUCKY				
Paducah	W. R. Kitterjohn	--------	Last Thurs.	--------
LOUISIANA				
New Orleans	R. S. Stearnes	336 Camp St.	1st Weds.	Teocalli Hall,
MAINE				
Portland	H. T. Boothby	222 Middle St.	1st. Mon.	--------
MARYLAND				
Baltimore	C. P. Pitt	15 E. Fayette	1st & 2d Tues.	Elk's Club
MASSACHUSETTS				
Boston	J. E. Wilson	263 Summer St.	4th Wed.	Boston City Club
Gardner	R. M. Gowell	Litchburg	1st Mon.	--------
Haverhill	J. D. Osgood	128 Essex St.	1st Mon.	--------
Millbury	L. H. Henshell	Worcester	2d Tues.	--------
Newton Center	J. E. Wilson	263 Summer St.	Monthly	--------
Springfield	Thus. Toukey	--------	--------	Cham. Com.
Worcester	L. H. Treadwell	681 Main St.	2d Tues.	44 Front St.
MICHIGAN				
Detroit	H. Shaw	613 Lincoln Bldg	Last Thurs.	G. A. R. Hall
Flint	J. Markle	718 S. Saginaw	--------	--------
Grand Rapids	--------	--------	Tues. Noon	Ass'n of Com.
Kalamazoo	M. Randall	Exch. Place	--------	Cham. Com.
MINNESOTA				
Duluth	Alfred L. Foster	210 W. 1st St.	1st Tuesday	--------
Minneapolis	Roy Constantine	2395 University Ave., St. Paul	2d & 4th Tues.	Builders' Exch.
St. Paul	Roy Constantine	2395 Univer. Av.	2d & 4th Mon. 6:30 P. M.	Elk's Club
MISSOURI				
Kansas City	Mr. Brown	899 Delaware	Tues. Evenings	University Club
St. Louis	A. J. Dunbar	Frisco Bldg.	Wed. Evening	Am. Hotel
NEBRASKA				
Omaha	T. Mustain	315 Neville St.	--------	--------
NEW HAMPSHIRE				
Portsmouth	F. C. Hatch	Kittery	2d & 4th Wed.	--------
NEW JERSEY				
Atlantic City	F. P. Wright	16 Ohio Ave.	1st Thursday	Malatesta Hotel
Jersey City	Wm. Doellner	743 Bergen Ave.	--------	P. S. Bldg.
Newark	Geo. E. Davis	23 Central Ave.	1st Monday	23 Central Ave.
Paterson	H. M. Desaix	88 Ellison St.	Last Friday	P. S. Bldg.
NEW YORK				
Albany	E. A. Jones	31 Hudson Ave.	1st Thursday	Pekin Rest'nt
Binghamton	A. H. Hyle	--------	--------	--------
Brooklyn	H. W. Walcott	12 Nevins St.	1st Mon.	Cham. Com.
Buffalo	E. P. McCormick	555 Wash. St.	Fridays	507 Elec. Bldg.
Cooperstown	B. B. St. John	Oneonta	3d Tues.	Vanon
Endicott	A. H. Hyle	Binghamton	Tues.	Cham. Com.
Jamestown	Henry Lund	309 Main St.	3d Mon.	Mfgrs. Ass'n.
Kingston	M. C. Rivenberg	--------	--------	--------
Nassau-Suffolk	J. A. Palmer	Huntington	--------	--------
New Brighton	E. L. Taylor	Tottenville	--------	--------
N. Y. Sec. No. 1	J. P. Ryan	26 Cortlandt St.	1st Thurs.	Penn's Hotel
Independent Sec. No. 3	John Perass L. F. Lwedecke	22 Chambers	1st and 3d Wed.	McAlpin Hotel
Ass'd. El. Con.	H. S. Beidelman	260 W. 86th St.	2d & 4th Wed.	226 W. 58th St.
Oneonta	B. B. St. John	--------	3d Thursday	--------
Rochester	Theo. Benz	State St.	Mon. 6:15	Builders' Exch.
Schenectady	Mr. Spengler	McClellan St.	Subject to call	--------
Syracuse	H. N. Smith	P. O. Box 809	1st & 3d Monday	--------
Troy	H. W. Boudey	First St.	1st Tues.	Gas Office
Utica	Mr. Hall	Gray Elec. Co.	Monthly	Elks' Club
Westchester	I. W. Austin	White Plains	--------	--------
Watertown	L. B. Smith	Roth Block	3d Fridays	Utilities Bldg.
Woodmere	Geo. La Salle	Westbury	--------	--------
Yonkers	Mr. Mayer	Manor House Sq	Monthly	--------
OHIO				
Akron	I. C. Wall	12 S. High St.	--------	Elec. Co.
Cincinnati	W. R. Keefer	939 E. McMillan	Tues. 3 P. M.	Cham. of Com.
Cleveland	Geo. D. Biery	E. 95th St.	1st & 3d Thurs.	Builders' Exch.
Columbus	O. A. Robins	Erner Hopkins	2d Wed.	Builders' Exch.
Springfield	J. R. Yost	--------	2d & 4th Fri.	--------
Steubenville	D. C. Hartford	--------	1st Wed.	Nat. Ex. Bank
Youngstown	W. Woobeck	Hood Elec. Co.	Mon. 6 P.M.	New China Res.
OREGON				
Portland	F. R. Whittlesey	212 Henry Bldg.	2d & 4th Monday	Cham. of Com.
PENNSYLVANIA				
Allentown	A. Hill	Bethlehem	Monthly	--------
Bethlehem	A. H. Hill	510 W. Main St.	--------	--------
Catasauqua	W. T. Kleppinger	--------	Last Thursday	--------
Dubois	C. E. Blakeslee	--------	Monthly	--------
Easton	G. E. Hill	Bethlehem	Monthly	--------
Erie	Earl Stokes	Bldrs. Exch.	--------	Bldrs. Exch.
Lancaster	A. Deen	--------	3rd Friday	Und'w't'rs Offices
Philadelphia	M. G. Sellers	1518 Sansom St.	and Thurs.	Builders' Exch.
Pittsburgh	Geo. Burrows	10 N. Diamond	--------	--------
Scranton	A. J. Fowler	Bd. of Tr. Bldg.	Tues.	Zenko's
St. Marys	C. E. Blakeslee	Dubois	Mon.	--------
York	A. E. Harris	E. King St.	2d & 4th Tues.	--------
SOUTH CAROLINA				
Columbia	E. L. Cashion	Sumter, S. C.	--------	--------
Greenville	E. C. DeBruhl	Ideal Elec.	--------	--------
TENNESSEE				
Chattanooga	Carl Schnider	412 Kirby Av.	Wednesday Noons.	Manhattan Cafe
Knoxville	H. M. Moses	615 Market St.	Monthly	Rwy. Lt. Co.
Memphis	H. A. Street	285 Madison Av.	Ev. other Wed.	Allyn Cafe
Nashville	J. B. Mullen	Arcade	1st & 3d Wed.	Tularie Hotel
TEXAS				
Dallas	P. B. Seastrunk	Lepscombe Elec. Co.	Wed. 8 P.M.	1805 Main St.
VIRGINIA				
Norfolk	K. D. Briggs	Arcade Bdg.	Wednesdays	Old Col. Clb.
Richmond	W. A. Cutlett	Jeff. & Grace Sts	--------	--------
WASHINGTON				
Seattle	T. C. Smith	--------	--------	--------
WISCONSIN				
Madison	Otto Harloff	602 State St.	1st Fri.	Fuller Op. Ho'e
Milwaukee	H. M. Northrup	25 Erie St.	2nd Tuesday	Maryland Hotel
CANADA				
Toronto	J. A. McKay	110 Church St.	1st. Thur.	Bd. of Trade
Vancouver	H. R. Hargreaves	Pacific Bldg.	--------	--------

Associations can secure listings here by sending necessary data to the National office

Removal of Headquarters of National Association to Larger Offices

Increasing Membership Calls for More Spacious Quarters—Now in New Building Conveniently Located in Heart of New York City

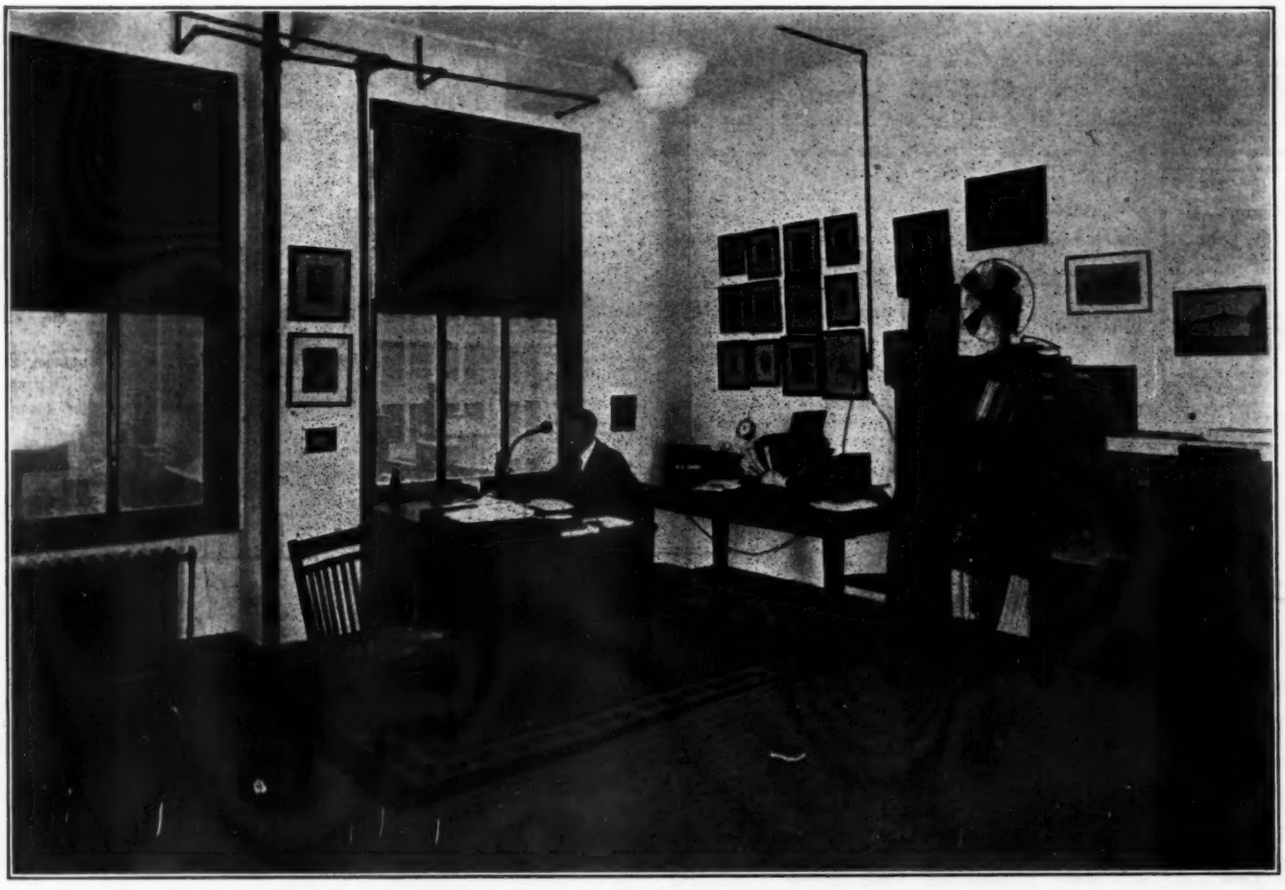
Several years ago headquarters offices of the National Association of Electrical Contractors and Dealers were established in the World's Tower Building on Fortieth Street, just off of Broadway, New York. The space was limited, and as the organization grew there was an urgent demand for more room. In these days of general housing shortage and sky high rentals it was a difficult task to find suitable offices for National Headquarters. But after searching the Island of Manhattan from Ship News dock to Spuytenduyvil Creek, loft space was found right in midtown—and only about three blocks from the former offices.

The new location is all that could be desired. The address is 15 West 37th Street, just about midway between the Grand Central Station to the Northeast of it and the Pennsylvania Station on the Southwest. It is within a few steps of the far famed Fifth Avenue shopping district; the Waldorf-Astoria hotel is only three blocks South of it; the famous Tiffany's is across Fifth Avenue; in fact many of the greatest retail establishments of the world are located in the same zone and but a few blocks distant.

Not that National Headquarters would voluntarily seek such classy though not undesirable neighbors, but the owner of the new loft building offered an attractive leasehold for a term of years, which in itself was an inducement worth considering, aside from the pleasant environment.

So April Fool's Day, 1921, marked unusual activities at National Headquarters, which were not devoted to the regular routine of business. In fact several days previous to that date found the entire force busily engaged in sorting, wrapping, and packing the almost endless number of pamphlets, blanks, circulars, and stationary that go toward equipping the literary end of a national organization. Then the desks, chairs, safes, cabinets, labor saving apparatus, together with all other removable fixtures, were loaded into trucks and dumped on the floor of the new quarters.

Continuing for several days, regular business operations were at a standstill, and nights, days, and Sundays were occupied in bringing order out of the



General Manager W. H. Morton at His Desk in the National Executive Committee Room

Accounting and Stenographic Department, Showing Office Manager Through Glass Partition at Right

New Headquarters Stationary Department in Which the Various Association Forms Are Filed and Collated

dump heap and establishing the working paraphanalia in its new home. As soon as this was accomplished, all hands joined in an endeavor to catch up the loose ends of their daily tasks.

Those members of the National Association who were awaiting replies to their letters, or waiting for the arrival of a delayed order from headquarters, may now know the cause of the delay. As the new offices are at last completely settled and the entire force is again performing its regular functions, there should be no further delays.

The new quarters are modern in every respect. The large floor space was fitted up with interior partitions to fit all requirements. With ample light and ventilation, these new offices are most desirable; then with fresh decorating and plenty of room, National Headquarters is an ideal workshop.

After everything was in shipshape and operations were proceeding as usual, the photographer was brought in and photographs were made. On this page and preceding pages are shown reproductions of the new quarters with the force in its regular work clothes. The illustrations portray the various departments of National Headquarters and give a very good idea of the size and layout of the offices.

It is hardly necessary to say that visitors will be welcome at all times. Remember the new address, 15 West 37th Street, near Fifth Avenue; and the new telephone number is Fitz Roy 0325. Come and see us.

New Utility Bill in Iowa

Special Representative of Contractor-Dealer Association in State Opposes It

Word comes from George W. Hill, special representative of the Iowa State Association of Electrical Contractors and Dealers that the Springer bill, which creates a court of public service to adjudicate disputes between city officials and utilities, was finally passed on March 29.

The bill provides for a court of public service, consisting of three District court judges, to be appointed by the chief justice of the Supreme court. All disputes between city councils or boards of supervisors and public utilities may be appealed to this court, which shall have power to cancel any rate that is not "just, reasonable and adequate."

Public utilities are to surrender their passage of this legislation, and writes an indeterminate franchise which can be cancelled by the court when it is not in use or when public necessity requires.

Mr. Hill was strongly opposed to the passage of this legislation, and writes that he believes it will work to the great disadvantage of contractor-dealer interests in his state.

Electrical Safety Conference

A new pamphlet has recently been issued by the Electrical Safety Conference, entitled "Safety Standard for Industrial Control Equipment." It is intended to be used in conjunction with Part 3 of the National Electrical Safety Code.

This new pamphlet gives the scope, definitions, and classes of such equipment, description of hazards, methods of protection, and general rules applying to same.

The Electrical Safety Conference is an association of representatives of national organizations interested in questions affecting accident hazards arising from the design, construction, installation and use of electrical appliances.

The coöperating organizations are as follows: Associated Manufacturers of Electrical Supplies; Bureau of Standards; The Electric Power Club; National Workmen's Compensation Service Bureau; Underwriters' Laboratories.

The objects of the Conference are: To promote by coöperative effort the orderly, consistent and proper development of practice in electrical manufac-

Electrical Contractor-Dealer Magazine Department in New Quarters Showing Editorial Room at Rear Right

tures and installations with regard to accident hazards.

To promote the development and adoption of safety standards for the construction and test of electrical appliances and for their application and installation.

To promote and make uniform the application of electrical safety codes both in regard to general principles and in regard to particular classes of appliances and systems.

The officers are A. W. Beresford, chairman; A. W. Whitney, vice chairman; and Dana Pierce, secretary. The office of the secretary is at 25 City Hall Place, New York City.

Washington Devereux Honored

The members of the Electric Club of Philadelphia were let into a secret and also pleasantly surprised at their special meeting held March 31, 1921, at the Arcadia Cafe in that city.

Only Frank C. Groves, chairman of the club's entertainment committee knew that Washington Dexereux, manager of the electrical department, Board of Fire Underwriters, would leave on April 4 for Mt. Clemens.

"Wash," as the genial Devereux is dubbed, has overtaxed his energy in effecting better inspections and laws for the guidance of electrical installations in Philadelphia and Baltimore; therefore the physicians ordered him away to recuperate. When the stage was set, Chairman Groves, in effusive and glowing terms, paid Mr. Devereux a wonderful tribute and presented him on behalf of the Electric Club, transportation and Pullman reservations to his destination.

In an outburst of applause which lasted for several minutes Mr. Devereux received this token of good wishes and regards from his fellow members.

The feeling of high regard for "Wash" Devereux which is held by all his associates was evidenced in a most touching manner and this occasion was another event of importance in the life of the electrical industry. The feeling of coöperation between all branches of the industry was remarkably shown on this occasion as the brotherly spirit manifested speaks well for the future.

No one in the electrical business is better known that Mr. Devereux, whose untiring efforts has helped to bring the present day standards to a high level. He has coöperated with every branch of the industry in earnest effort to bring legislation and laws in effect for safety first and fire protection. His efforts helped to bring the Electric Club of Philadelphia into existence and his hard work is now helping to make it bigger and better.

All his friends and business coöperators will miss the fatherly guidance of "Wash" Devereux until his return from Mt. Clemens. Everyone who knows "Wash" Devereux expects his return soon to his regular vocation, therefore he carries away with him the love and affection of the whole industry and best wishes for his speedy recovery.

Detachable Fixtures

National Executive Committee Passes Resolution in Interests of Contractor-Dealer

Serious discussion relating to the "hang a fixture like a picture" idea was the cause of the Executive Committee of the National Association of Electrical Contractors and Dealers passing the following resolution:

"*Resolved*, That the Executive Committee of the National Association of Electrical Contractors and Dealers are opposed to the development by manufacturers of any detachable fixture device, unless the same be fully interchangeable."

The committee believes that the development and marketing of several detachable fixtures, which are not interchangeable, would be a serious detriment to the industry, causing expense, inconvenience and annoyance to both the seller and the user of such devices.

On this account they feel that it would be better not to have any such device produced unless it could be produced by concerted action on the part of the manufacturers resulting in any devices that are put on the market being entirely and fully interchangeable.

Manufacturers' Council

Shiras Morris, President of the Hart & Hegeman Mfg. Company, Hartford, Conn., has been elected Treasurer of the Electrical Manufacturers Council to fill the unexpired term of Edward B. Hatch, who died recently.

Resolutions of sympathy on the death of Mr. Hatch have been passed by the Council. Mr. Hatch, who died on February 18, had been a member of the Council since its organization on February 7, 1916 and its Treasurer from November 7, 1919.

A Transportation Committee has been created by the Council to take up matters of railroad freight classification. The committee is composed of W. B. Everest, chairman; M. C. Fitzgerald, A. T. Zwack and F. C. Bryan.

N. E. L. A. Kilo Watt Campaign

At the Chicago meeting of the National Executive Committee of the N. E. L. A., the members of that committee unanimously voted in favor of continuing the National "Kilo Watt" campaign by the issuance of a second series of "Kilo Watt" pamphlets.

These pamphlets are now completed a sample set together with price list and order blank will be sent upon application to headquarters.

These pamphlets are designed for use as envelope stuffers to be sent out in customers' bills one each month beginning with May, or in the case of companies which utilized the first series of "Kilo Watt" and were late in beginning their campaign, to follow immediately the sending out of the six pamphlets of the first series.

This campaign is national in scope. Nearly seven million of the first series of pamphlets were sent out, reaching in excess of 1,100,000 customers.

Montana Convention

The Montana State Association of Electrical Contractors and Dealers held its convention at Butte, Montana, on April 14, 15, and 16. It is hoped that a complete report will be received for publication in our next issue.

Samuel Adams Chase, special representative of the Westinghouse Electric and Manufacturing Company attended this meeting and talked on better wiring and merchandising.

The following wire was received from the convention as we went to press:

"Butte, Montana, April 15, 1921.

"Montana State Association of Electrical Contractors and Dealers today passed resolution unanimously indorsing National Association and making application for membership. The committee is now engaged in procuring applications. Resolution also passed inviting power companies and central stations to affiliate as associate members. Resolution will be adopted tomorrow inviting exchange of delegates and representatives with State Architects' Association at respective conventions. Wonderful reception for General Electric circus

and Westinghouse show. From many expressions received from representatives from all branches of the industry, believe Chase visit has done a lot of good. Proceedings of tomorrow's session will be sent later."

N. A. C. A. Annual Convention

The preliminary program of the annual convention of the National Association of Cost Accountants which is to be held in Cleveland on September 14, 15 and 16 next, has just been issued. It provides for three days of conferences on practical cost questions including "Interest as an Element of Cost," "Cost Systems as a Means of Preventing Waste," "Uniform Methods and Standardized Costs," "Executive Use of a Cost System," and a number of similar topics. It is expected that upwards of one thousand cost men will take part in these conferences.

Annual Banquet

Barrows Electric Shops of Pittsburgh Have Enjoyable Celebration

The slogan of the Barrows Electric Shops, Inc., Pittsburgh, Pennsylvania, is "Things and Doings Electrical," and the way they do things would seem to indicate that they know the meaning of their motto.

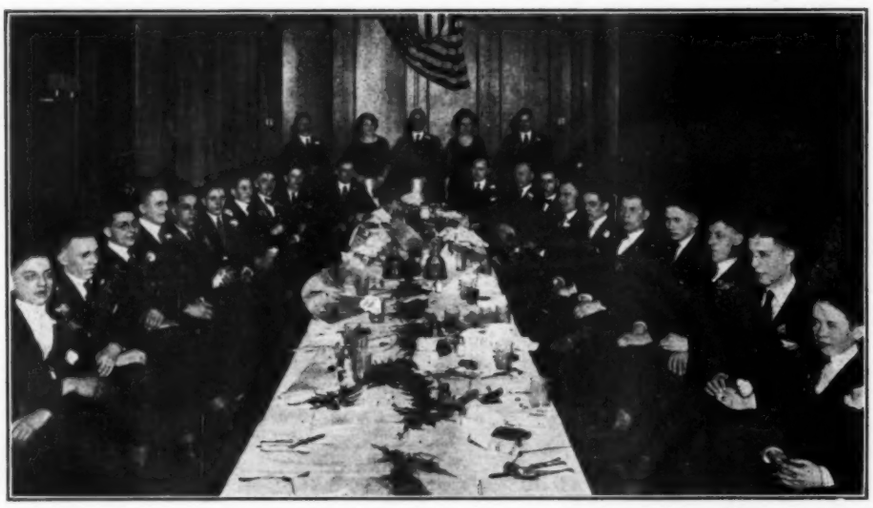
This year they held their third annual banquet. John Watson, secretary of the company and manager of the Wilkinsburg store acted as toastmaster. After a brief speech of welcome he called on several of the members of the organization for entertainment features and about ten of them responded with short talks relating to some phase of their work. Miss Niedermeiser, the accountant, sang a song, and Miss DeMuth, treasurer of the company, gave some of her experiences during her services with the "American" and now the "Barrows" Shops.

Representatives of the Duquesne Light Company were present and gave interesting talks. George Barrows, president of the company which bears his name, said in part:

"Just about a year ago we met in this same room. At that time I told you that it was one of the happiest moments of my life to be able to sit down with so large a number of fellow workers and have a heart to heart talk. I told you that it was the dream of my life to have just such a meeting some day and to be able to declare a dividend on our year's business in which each one of you would participate. I am happy to say tonight that dream has come true. Last year was our banner year and each one of you will receive some share of the company's earnings on the year's business.

"Steve Curry, who helped me start this business almost ten years ago, working as stock boy for $4 per week and who now drives the company's truck and does a million and one other things, will get $500. Miss DeMuth, our treasurer, who started with me about six years ago as bookkeeper at $8 a week, will receive $1,000 as her bonus or dividend."

In closing, Mr. Barrows thanked his associates for their loyalty and the excellent work that made it possible to declare a dividend or bonus.



Third Annual Banquet of Barrows Electric Shops, Inc., Pittsburgh, Pennsylvania, Mr. Barrows Standing at Rear, Center

Course in Cost Accounting

Lessons Arranged from Plan Used by Extension Division of University of California

As has previously been announced, the Standard Accounting System of the National Association of Electrical Contractors and Dealers was some time ago taken up by the Extension Division of the University of California. This was done through the efforts of the California Electrical Coöperative Campaign committee, and the accounting course is now being successfully operated at the University.

Under the supervision of Prof. Henry R. Hatfield, dean of the faculties and professor of accounting, there is now being prepared a series of articles by Paul B. Kelly, research accountant. It is said that these articles constitute a University course in cost accounting, practically the same as is being used by the University in its correspondence course.

The Journal of Electricity and Western Industry of San Francisco is running these articles, reproducing the various forms used in the Standard Accounting System, and will presnt the entire series.

The articles explain in simple terms, aided by illustrations, the features of cost accounting, how it can be applied to the contractor-dealer business, and why it should be employed.

Cleveland's Home Electric

Sunday, May 15, is the positive date set by the special committee of the Cleveland Electrical League for the opening of the first modern electrical home in that city.

Elaborate plans already are being made for the opening and for an extensive publicity campaign. Two of the daily papers—the Plain Dealer and News-Leader—are planning to issue special tabloid sections on the opening day. These will contain editorial matter telling what should go into a modern home and how it should go in, and approximate costs of maintaining a complete electrical labor saving service in the average home.

Many local electrical firms already have contracted to advertise in these sections.

The modern home committee, of which W. J. Marshall is chairman, has decided to open the second home sometime in July and the third in the fall—thus stretching out the modern home campaign over a six months' period.

The Fixture Market and the Salesman

National Light Rays, the Fixture Manufacturers' bulletin, says:

Now and again we meet a salesman who doesn't believe in the Annual Fixture Market. He admits that it may be good for business—yes, sir!—but not for the salesman. He considers that it deprives him of orders within his territory which he personally would otherwise secure. He feels sore.

The Fixture Market is the most powerful booster of the salesman's orderbook—except, perhaps, the steady, effective, consistent advertising which his firm puts out—that could possibly be devised.

The dealer who has attended the Fixture Market is in a far more receptive mood to listen to the salesman's talk, for he knows from actually seeing them how good the fixtures are. He is ready to talk business without preliminary enthusing. He saves the salesman's time, so that the salesman can make more calls, other things being equal, mean more sales.

The dealer who has *not* attended the Market has at any rate heard of it—unless he is completly asleep at the switch—and the salesman has the advantage of the prestige of his firm having exhibited their products at Buffalo. He does not need to prove that he represents a progressive firm. It is obvious.

Compared with these advantages, the salesman, perhaps, loses a few orders, but each of the fixtures thus sold brings in inquiries for many more.

Where does the salesman *lose?* The answer is, he doesn't.

State Representative

A few months ago Iowa contractors set the pace by employing a man to stir up interest in the state organization, and now the New York State Association of Electrical Contractors and Dealers has followed suit.

Herbert S. Gray is the New York special representative. He started out from the office of Secretary Ryan on March 21 and is calling on members, doing missionary and educational work.

After considerable uncertainty over the selection of a suitable building it has been announced that the New York Electrical Exposition will be held at the 71st Regiment Armory, Park Avenue and 34th Street, New York, during the ten days beginning September 28.

Returns to Toronto

Frank T. Groome has completed his work undertaken in connection with the industrial lighting campaign of the Electrical League of Cleveland, and has returned to Toronto.

Mr. Groome was invited to Cleveland by the Erner Electric Company to aid

Frank T. Groome

in organizing and in carrying on a city wide campaign of education among industrial plant executives. As a member of the Industrial Lighting Committee of the Electrical League, his work was very effective.

Mr. Groome is best known as an organizer of the Ontario Association of Electrical Contractors and Dealers in Toronto. Later, he organized both the electrical jobbers and manufacturers of Canada.

Lighting Demonstrations

Gen. Geo. H. Harries, chairman of the advisory executive committee, and Clarence L. Law, chairman of the educational exhibits committee, both of the department of lighting of the National Electric Light Association, last month made public the report of Ward Harrison, field director of the lighting campaign which is being carried on by that organization.

Permanent exhibits for the demonstration were planned in thirty-four cities. Eight of these are now ready and they include Baltimore, New York, San Francisco, Louisville, Cincinnati, Cleveland, Buffalo, and Pittsburgh. In five more cities the demonstrations are under way, and four more cities have definitely decided to take on an exhibit.

Mr. Harrison expresses his appreciation of the hearty coöperation received from all sources in connection with the establishment of these demonstrations and also for the uniformly favorable expressions of opinion received as to the value of the exhibits.

I. E. S. Annual Convention

The annual convention of the Illuminating Engineering Society will be held in Rochester, N. Y., during the week of September 26, 1921. Robert M. Searle, vice president of the Rochester Gas & Electric Corporation has been appointed chairman of the general committee for the 1921 convention.

A Strange Mixture

The following letter from the Gray Electric Company, Springfield, Ohio, explains itself: "We received this morning a check from one of our customers. The imprint on the check being of considerable interest, we copy it as follows:

> *"Sheet metal workers, plumbers, electricians, landscape architects, shrubs, trees and flowers, carpenter work, chimney and foundation repairs.'*

"We have in times past noticed several rather interesting combinations of business associated with that of electrical contracting and merchandsing, but this seemed to cap the climax."

Pittsburgh's Lighting Show

By J. H. Van Aernam

President of Electrical League Tells of Benefits of Exhibition

The local Lighting Demonstration has been dismantled, but the tearing down of a perfect wiring job will contrast the building up of poor lighting to something better as a result of the past month's continued hammering of the words "Right Lighting" in Pittsburgh.

To get a smooth working machine necessary to put on a demonstration, which in cost of labor and material (all at cost) amounted to $4,000, and to keep the entire show free from commercialism, needed hard working men, broad minded and willing to sacrifice business, perhaps, for the education of those in a busy center of industry. The Electric League of Pittsburgh had a committee that met these requirements.

The various evening were scheduled to those organizations who had ex-

pressed themselves as quite willing to be shown. To assure an attendance, have a chairman for the evening, and see that assistance be given those "fearful of the foot candle meter," a host was selected from the League who was supposed to go before the meeting of these associations, explain to them what they were to see, and then select a committee of ten men to help, not only in getting the membership of that association out for their respective evening, but also to act as a reception committee on the scheduled evening and assist the guests in reading the meters.

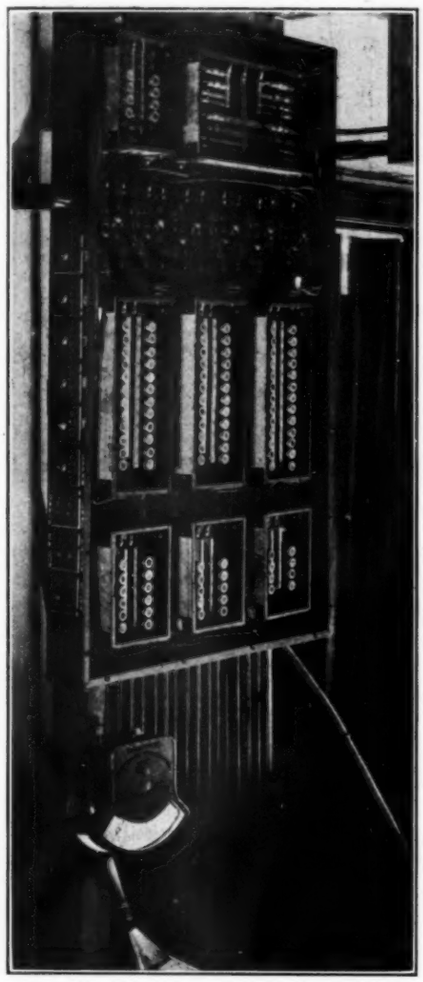
Leaflets and invitations were provided for all secretaries of those associations when notices were sent out to their regular meeting. These same leaflets and invitations, together with stickers, were used by those who made the demonstration possible by their generous financial donations. Street cars hurled a message of Better Light to the public by means of a sign, and although it is easy to criticize the press from a selfish viewpoint, we have to admit they gave us a just space.

The salesmen of the electrical industry talked Good Lighting, and, the prestige of being in the Chamber of Commerce Auditorium, gave weight to our words. Pittsburgh knows today why in the first chapter of the Bible there is the statement: "Let there be light".

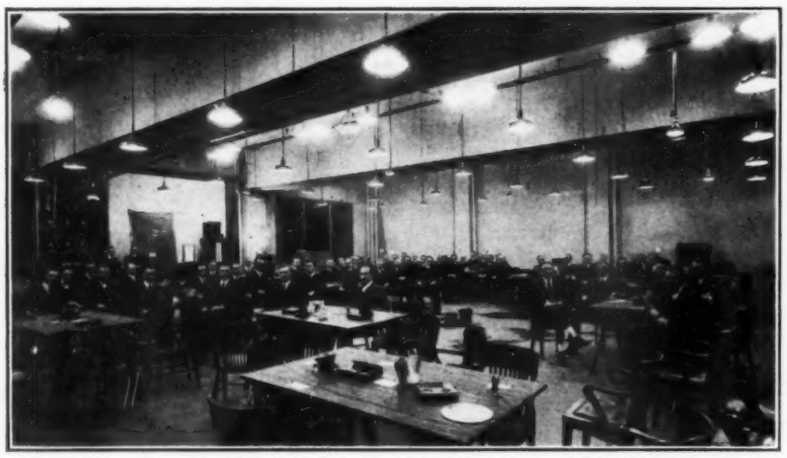
The installation followed the specifications which were commonly used in other cities as regards properties and equipment, but we felt that we should go one better and therefore every detail was watched to make it a perfect "wiring job".

Photographs show that it was a conduit installation and the remote control panel created no little interest. Each evening the point was emphasized that when bids were requested on a wiring installation, be sure that the contractor was bidding on a "real job", before his bid was thrown out for being high.

The equipment has been sent to the Physics Laboratory of the Carnegie Institute of Technology, where it will be installed permanently, and in its completion our hope of last October will have been realized. Three thousand have seen the demonstration; how many know about it, we dare not estimate.



Gigantic Control Panel Used at Pittsburgh Lighting Demonstration



Demonstratng Room Set for Pittsburgh Lighting Show

News Notes Concerning Electrical Contractor-Dealers

Business Changes, Store Improvements, and New Establishments Opened

Misser & McCasson have opened a new electric supply store at Auburn, Indiana.

Cooper Electric Company is reported to have opened a new store at 2029 Fifth Avenue, Birmingham, Ala.

The B. C. Electric Company, because of increase of business, will occupy new and larger quarters in the Marmac Hotel Building, Columbia, S. C.

Jones Brothers Electric Company is opening a new store at 5641 Rural Street, East Liberty, Pa.

D. W. Ward has opened a new electric supply business at 591 Madison Avenue, Memphis, Tenn.

Fred C. Bacon will open a new store carrying electric supplies at 113 North Chestnut Street, Seymour, Ind.

Electric Service Engineering Company, in the electric appliance business at 1416 Broadway, New York City, will open a new store at 105 West 47th Street, New York City.

Burns Coakley is opening a new electric supply store at Nelsonville, Ohio.

Jones Electrical Company is reported to have opened a new store at Hattiesburg, Miss.

Tait & Earl will open a new electrical business at McEwen Street, Warwick, New York.

Peter Castholm has opened a new electric appliance store at 728 North Main Street, Wichita, Kansas.

H. D. Slear Electric Company, successors to Slear-Van Slyke Electric Company, is opening a new store carrying electric supplies at Puyallup, Wash.

J. G. Greece has opened a new electric supply store at Greenville, Ala.

Boldin Carson Electric Company will open a new electric appliance business at 328 North Main Street, Decatur, Ill.

J. O. Gosselin is reported to have opened a new electric store at 115 Main Street, Waterville, Maine.

Thomson & West Electric Company is opening a new store at 2426 Central Avenue, Cleveland, Ohio.

Hollister & Schreffler are going to open a new electric supply business at Hobart, Ind.

R. L. Gourlie has opened a new store carrying electric supplies at Silverton, Oregon.

Central Electric Company, of which Gordon & Johnson are proprietors, is opening a new store at 115 West College Street, Albert Lea, Minn.

Home Electric Appliance Company will open a new electric business at Steubenville, Ohio.

Gardner Electric Company is reported to have opened a new electric appliance store at La Junta, Colo.

Lasey-Miller Company, in the electric supply business at Kokomo, Ind., is opening a new store at Tipton, Ind.

Noland Electrical Company has opened a new store at Lebanon, Tenn.

Feeters Electric Company will open a new business carrying electrical supplies at Fourth Street, Martins Ferry, Ohio.

Electric Shops, of which Clyde L. Utley is proprietor, will open a new store at Escanaba, Mich.

Freeman Electric Company, of which Charles Freeman and John Wilhelm are proprietors, is opening a new electric appliance store at Clay Center, Kans.

Luxham Electrical Supply Company, a branch of the Fort Wayne Oil & Supply Company, has opened a new store at Fort Wayne, Ind.

Cooper, Cheatham & Roberts are opening a new electric supply store at Carlisle, Ky.

W. H. Brooks will open a new electric appliance business at 427 South 10th Street, Quincy, Ill.

Hennequin Bros. in the electrical business at Torrington, Conn., are opening a store at Winsted, Conn.

Hale Electric Company has opened a new store at East Main Street, Webster, Mass.

Greenwood & Davis are reported to have opened a new electric supply store at 935 Central Avenue, Hamilton, Ohio.

Sanford Electric Corporation has opened a new store carrying electrical supplies at Belleville, New Jersey. Inc. cap. $100,000. Incorporators: J. B. Lake, Kellogg, and others.

Star Electric Company is opening a new store at Amherst, Mass.

Fred Hesser and Estel Davis will open a new electric appliance store at 407 Main Street, Carthage, Mo.

Wheeler & Schrader have opened a new electric store at 80 Freeman Avenue, Stratford, Conn.

Taggard & Gill will open a new electric appliance store at Ceres, Calif.

William Ruth has opened a new electric business at Main Street, Bethlehem, Pa.

Arverne Electrical Contractor of which B. Smollen is proprietor, is opening a new electric store at 6521 Boulevard, Arverne, N. Y.

Harvey, Brown & Johnson are reported to have opened a new electric store at Baldwin, New York.

Gainaday Electric Company has opened a new store carrying electrical supplies at 302 Chestnut Street, Harrisburgh, Pa.

Clemons Electric Company will open a new electric appliance business at 5 West 110th Street, New York City.

Coraopolis Electric Company is opening a new store at 510 Mill Street, Coraopolis, Pa. The proprietors are Foley and Neison.

Robert Brittingham is reported to have opened an electrical and general store at West Sixth Street, Laurel, Del.

Steele Electric Company has opened a new store at Brockville, Pa.

A. W. Grimmenstein will open a new electric appliance business at Redwood City, California.

Ray & Wirtinan are opening a new store carrying electrical supplies at Baldwinsville, New York.

The Star Electric Co. is the name of a new electric store at Brunswick, Georgia, under the management of E. B. Arnold, who was formerly a partner in the Electric Equipment Co. of that city.

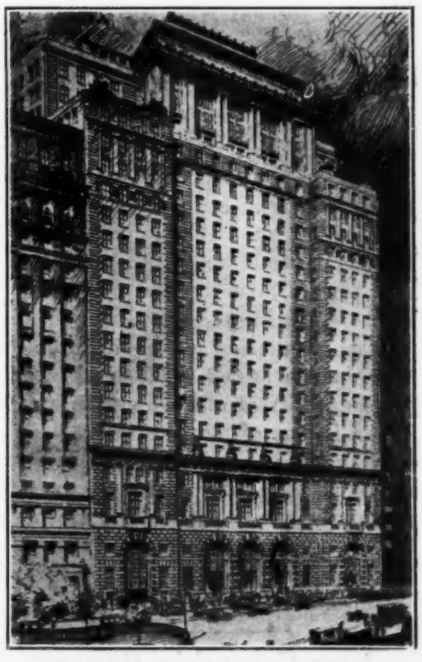
DO YOU include the Code of Practice as a part of your bid? It saves misunderstandings.

"The Leaguer," published weekly by the Cleveland Electrical League, has been having some fun with J. L. Wolf, Secretary of the Lighting Fixture Dealers Society. The accompanying illustration, showing Brother Wolf topped off with a crown of the "hang a fixture like a picture" design, is taken from The Leaguer's Cartoon

Court House Contract

N. L. Walker, president of the Walker Electric Company, Raleigh, North Carolina, sends word that he has just closed a contract for the electrical equipment of the Johnson county court house at Smithfield, N. C.

Mr. Walker is a member of the National Association of Electrical Contractors and Dealers, and a live contractor-dealer who does a prosperous business in spite of the talk of depression and buyers' strikes.



New Cunard Building, 25 Broadway, New York City, for Which the Western Electric Company Supplied 4500 Duplexalites, Installed by Lord Electric Company, New York

•MANUFACTURING•

A Department Devoted to the Latest Devices Used by the Electrical Contractor and Dealer

Two New Specialties

A small cord connector, shown in one of the accompanying illustrations, has been designed by the specialty and switch department of the Cutler-Hammer Mfg. Co., of Milwaukee, for use with drink mixers, portable electric heaters, washing and ironing machines,

Small Size and Knurled Finish Caps of C-H Cord Connector Gives it Unusually Attractive Appearance

hair clippers, and other electric appliances which demand a neat cord connector of small size and adequate capacity. It has the National Electrical Code rating of 10 amperes, 250 volts.

It is one inch in diameter, the caps being a trifle wider, and has a total length of only two inches. The knurled finish of the caps, with the lines converging towards the apexes, gives the connector a small, symmetrical and attractive appearance. The caps are sufficiently long to completly conceal the ends of the cord that are covered by binding, so only the smooth and regular covering of the cord is visible where it enters the caps.

Small C-H Motor Attachment Plug For Use With Motor-Driven Domestic Appliances

A motor attachment plug of a similar type, known as No. 7855, and having the same current and voltage rating, is shown in one of the illustrations. The base and body both have a diameter of one inch. Its small and attractive appearance makes it particularly desirable for use with small motor-operated utility devices in the home, office and restaurant.

New Columbia Battery

The extremely popular demand for a dry battery of two cell-power has been met by the National Carbon Company, Inc., with its new Columbia Bell Ringer. The Bell Ringer is of the same sturdy moisture proof construction as the popular line of Columbia Shot batteries manufactured by the same company.

This battery, although designed primarily as a bell ringer, has a number of other equal important uses such as for operating heat regulators, annunciators and buzzers, electrical toys and wireless sets, single and burglar system, 3 volt lighting outfits, and any applications where but a light drain is necessary and long life is desirable.

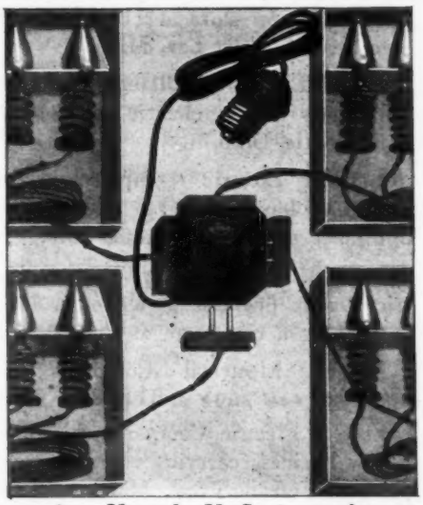
This battery is shown here in the nearest resemblance obtained with the use of a one color cut, the original battery having an attractive red, yellow and black label. The practicability of the battery is evident in that it lends itself to simple means of installation; a nail or hook of any kind being ample on which to hang the battery, and but two connections are made by the installer.

The National Carbon Company, Inc. Cleveland, Ohio, manufacturers of the Columbia line have also arranged for selling the Bell Ringer in a specially selected barrel assortment containing Hot Shot, Ignitor and Bell Ringer Batteries.

Tree Lighting Outfits

No longer is it necessary for a jobber or dealer to stock 16, 24 or 32-light electric Christmas-tree Lighting Outfits—8-light sets can now be hooked up to get the required number of lamps merely by plugging into a four-way distributor-block, just as we now plug into any current tap.

Under the name "Diamond-DeLuxe" the Diamond Electric Specialties Corporation, Newark, N. J., is putting on the market a line of Electric Decorative Outfits with which the trade will be able to meet all demands.



Past experience has shown that neither dealers nor jobbers care to stock 24-light and 32-light outfits in large quantities. They never know how many their customers will want. In nine cases out of ten, they would rather lose sales than be caught with an over supply of large size outfits.

The standardization of the Diamond-De Luxe Electric Decorative Outfit does away with this uncertainty. The dealer can now give his customer whatever his customer desires.

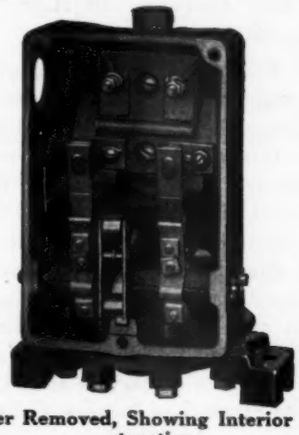
In place of the usual plug, the Diamond-De Luxe Electric Decorative Outfit is made with a connector. This connector plugs into the Diamond Four-Way Distributor exactly as any parallel blade two-piece plug snaps together.

Pressure Operated Switch

A pressure regulator of the diaphragm type, which has recently been developed by The Cutler-Hammer Mfg. Company, of Milwaukee, Wisconsin, is compact and simple in design.

This new device is arranged for easy

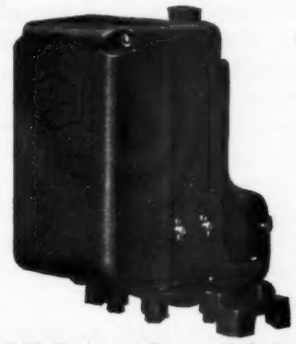
mounting, and its three overall dimensions are 6, 6½ and 8 inches. It is used with motor driven pumps or compressors controlled by a main line magnet switch or some other suitable automatic starting device. It has two poles, which



Cover Removed, Showing Interior Construction

enables it to be used also for connecting small A. C. and D. C. motors directly to the line.

The air, water, or other fluid under pressure is conducted into a chamber in the base of the regulator, and the pressure acts against a rubber dia-



New C-H Pressure-Operated Switch for Automatically Controlling Motor-Driven Pumps and Compressors

phragm and compresses a spiral spring, the normal compression of which can be changed by means of an adjusting nut to obtain various values of opening pressures up to 60 pounds per square inch.

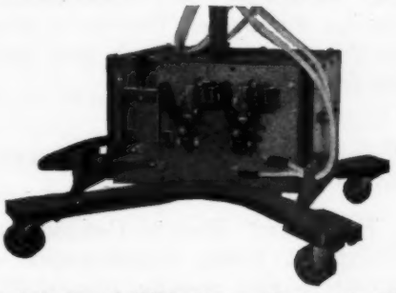
When the switch is closed and the pump or compressor operating, the pressure builds up, and when the adjusting spring has been compressed to a certain point, the switch snaps open and stops the motor. When the pressure has fallen to a predetermined point, the switch closes with a quick action, and the pump or compressor again operates to build up the pressure system.

The entire mechanism of the regulator is enclosed in a cast iron case arranged for the entrance of conduit. Terminals and fingers are exposed by taking off the cover of the case, which necessitates only the removal of three screws.

Controlling Studio Lights

A new departure in the control of large arc lights in moving picture studios is embodied in a studio arc lamp made by the Display Stage Lighting Co., Inc., New York, and shown in the accompanying illustrations.

The control of the arc is accomplished by means of a resistance box which is mounted on the base at the bottom of the lamp standard. The switch equipment on the resistance box consists of a double pole knife switch and two circuit breakers, which are shown in one of the illustrations. The switches and resist-



Switch Panel With Cover Removed; 50, 100 or 150 Amperes May Be Passed Through Arc

ances are made by The Cutler-Hammer Mfg. Co. of Milwaukee and New York.

The equipment is operated by first closing the knife switch, which connects the arc lamp in circuit with the resistance. The latter allows a current of 50 amperes to flow which is sufficient to cause the arc to glow. Either one of the two circuit breakers is then closed,

Arc Lamp Used in Movie Studios With Control Resistance Mounted on Base

shunting part of the resistance and increasing the current to 100 amperes. Closing the second circuit breaker further increases the current flow to 150 amperes.

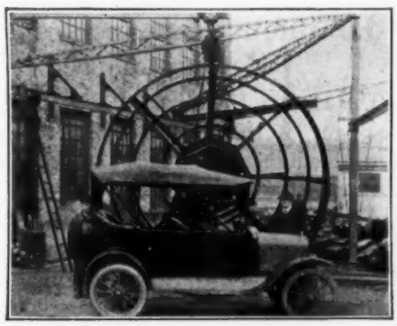
Should the arc fail to maintain itself or the current supply be shut off, the circuit breakers will trip out, thereby cutting all the resistance into circuit. Upon return of the current, which will be indicated by the glow of the arc, 50 amperes will be maintained until the circuit breakers are closed to increase the current to 100 and 150 amperes respectively.

The switch equipment and resistance are completely enclosed to prevent persons coming in contact with live parts. The switches and terminals are exposed by removing the sheet metal cover, which is accomplished by taking out four screws.

The entire equipment is made very compact and readily portable by the method of carrying the resistance box and the lamp on the same base.

Largest Indirect Lighting Fixture

The largest indirect fixture ever built has recently been installed by the National X-Ray Reflector Co., in the Alhambra Theatre, Milwaukee. This enormous indirect unit is fifteen feet in diameter and contains 118 lamps; the main bowl containing one hundred



Showing Steel Framework in Construction

200-watt Mazda C lamps in X-Ray Reflectors, and the lower bowl containing eighteen 60-watt lamps, the latter serving to light the large bowl and to be used in emergencies.

The fixture is suspended by eight two-inch pipes twenty-five feet long and hangs in the center of the dome over the auditorium of the theatre. It weighs approximately 5,500 pounds and is finished in ivory and gold.

The auxiliary lighting in other parts of the theatre not affected by the central fixture is done by means of 16

smaller fixtures similar to the large one.

Directly above the fixture there is a hole large enough to permit a man to climb down a ladder into the bowl. Below is a smaller bowl from which a cable can be lowered at the end of which is a leather outfit. By means of this, a man is hoisted to a position enabling him to clean the outside of the large bowl.

Colored lighting is the feature of the installation. In the central fixture the lamps are divided into four groups;

Great Fixture Installed

twenty-five each of red, blue, amber and white. The colors are secured by natural colored cover glasses placed over the reflectors. In the smaller fixtures the same scheme is carried out.

Luminous Buttons and Pendants

The Hart & Hegeman Manufacturing Company of Hartford, Connecticut, are now including luminous inserts on push switches and pendants.

A glance shows you just where the button is. No more fumbling or feeling along the wall. No more soiled or marred wall paper around the switch—

because these Radio Buttons glow their whereabouts in the dark.

In the hotel or apartment building switches with luminous buttons are particularly desirable. In case of fire, sickness or other emergency, light is the first thought and you want to find the switch buttons quickly.

You can now secure Paiste Sockets already equipped with these Radio-Glowing Pendants. They are permanently fastened to the pull socket chain. No time lost assembling them. Your clients will appreciate this added convenience of the Pull Socket. Here is an opportunity to tell about a new device—the Paiste Socket with Radio Pendants.

The company can also furnish these Pendants separately, to be attached to sockets, pull switches, etc., already installed. Merely cut off the big ball on the chain and slip the Luminous Pendant over the last small ball.

The public has become educated to the advantages of Radio-Glowing watches and clocks. They are looking for the same convenience in their lighting fixtures.

Condensed Notes of Interest to the Trade

The Bryant Electric Company of Bridgeport, Conn., manufacturers of wiring devices, recently completed a four story and basement steel and brick building which will be used as a finished goods warehouse and shipping department. The building contains over 67,000 square feet of floor space. It is white enameled throughout, like other buildings of the Bryant factory, and a portion of the top floor will be used as a rest room for women employes.

"Light Touches" is the title of a new institutional magazine published by the Westinghouse Lamp Company, New York City. It is to be issued monthly and should be read by all who are interested in better lighting.

The Ajax Electric Specialty Company, St. Louis, Mo., has resumed production on Plural Socket Plugs, and hereafter they will be packed in individual cartons. The carton can be used as a counter display in addition to the three color easel and hanger furnished by the company.

Philip K. Murdock has been appointed export sales manager of the Bryant Electric Company of Bridgeport, Conn. In 1916 Mr. Murdock entered the Bryant organization as assistant to the sales service engineer. He recently represented the Bryant interests in the South Atlantic seaboard states, with headquarters in Atlanta.

A. C. Nelson, formerly of S. B. Condit, Jr., & Company, Boston, has been appointed New England sales manager of the Arrow Electric Company for the entire New England district. Mr. Nelson will make his headquarters at Room 621, Rice Building, 10 High Street, Boston, Mass.

The T. & W. Electrical Manufacturing Company, Inc., found it necessary to enlarge their factory in California, owing to the big increase in business and the ever increasing demand for the T. & W. Universal Plugs. This is said to be because of the quality and stability of these plugs. The company since incorporating in 1919 has had a rapid growth and owes it to legitimate merchandising and first class material that lasts. The new factory is at 2043 Sacramento Street, Los Angeles, California.

Announcement has been made by the Austin Machinery Corporation of Chicago that it will rebuild its plant at Winthrop Harbor, Illinois, recently destroyed by fire. The loss at this plant was extensive, but the corporation is in position to take care of all business through the duplication of its production facilities at its Muskegon plant or Toledo plant (formerly the Toledo Bridge and Crane Company). Ample stocks are on hand at these two plants to take care of immediate demands.

H. D. James has been appointed manager of the industrial division of the Cincinnati district office of the Westinghouse Electric & Manufacturing Company to succeed F. G. Kirkpatrick, who recently resigned.

F. B. Jewett, chief engineer of the Western Electric Company, who is one of the best known telephone engineers in the United States, has been elected vice president and director of the company. He will continue his present duties in charge of the technical forces of the great telephone manufacturing industry.

The Electric Refrigeration Exhibit held during the week of April 4 in the showrooms of The New York Edison Company was a success far beyond the most sanguine hopes of the Edison officials.

The Westinghouse Elec. & Mfg. Co. has just issued a leaflet which describes and illustrates the automatic electric ovens for commercial baking of pies, bread, cakes and pastry. This leaflet is printed in two colors and it gives in detail the construction and advantages of the use of electric ovens.